

OKI[®]

People to People Technology™



PACEMARK 4410

High Speed Forms Printer



User's Guide

Every effort has been made to ensure that the information in this document is complete, accurate, and up-to-date. Okidata assumes no responsibility for the results of errors beyond its control. Okidata also cannot guarantee that changes in software and equipment made by other manufacturers and referred to in this guide will not affect the applicability of the information in it. Mention of software products manufactured by other companies does not necessarily constitute endorsement by Okidata.

© 2000 by Okidata. All rights reserved.

Second edition January, 2000.

Written and produced by the Okidata Training & Publications Department. Please address any comments by mail to:

Training & Publications Department
Okidata, Division of Oki America, Inc.
2000 Bishops Gate Blvd.
Mount Laurel, NJ 08054-4620

or by email to

pubs@okidata.com

For the latest product information and manuals, we welcome you to visit our web site:

<http://www.okidata.com>

Year 2000 Compliance

All products currently sold by Okidata are Year 2000 Compliant. Each product contains information technology that accurately processes date and time data between the years 1999 and 2000. These products, when used in combination with products purchased from other manufacturers, whose products properly exchange date and time information, will accurately process the date and time. All future products are committed to meeting the same Year 2000 compliance.

ENERGY STAR®



As an ENERGY STAR Partner, Oki Data has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

OKI and OKIDATA are registered trademarks/marques déposées/marcas registradas Oki Electric Industry Company, Ltd.

ENERGY STAR is a trademark of the United States Environmental Protection Agency. Epson is a registered trademark of Epson America, Inc. Ethernet is a trademark of Digital Equipment Corporation. IBM is a registered trademark of International Business Machines Corp. Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries.

Conventions Used in this User's Guide

Notes

Note: Notes are set in regular type and contain general information.

Cautions

Caution! *Cautions are set in bold italics and contain information regarding actions which could potentially cause personal injury or damage to the printer.*

Important Information

Important! *Important information is set in italics.*

Contents

1: Front Panel	8
Print Mode: Indicator Lights	8
Print Mode: Control Panel Buttons	9
Menu Mode: Control Panel Buttons	10
Menu Mode: Configuring Your Printer	11
Entering/Exiting the Menu Mode	11
Changing the Menu Settings	11
Saving Configurations	11
Switching Back and Forth between Configurations	12
Resetting the Menu	12
Printing a List of Menu Items	12
Summary of Menu Settings	13
Explanation of Menu Settings	17
2: Maintenance	22
Replacing the Ribbon	22
Clearing Paper Jams	25
Front Feed Jams	25
Rear Feed Jams	27
Replacing the Power Fuse	28
Cleaning the Housing	29
Cleaning the Interior	29
Cleaning the Exterior	30
3: Troubleshooting	31
General Troubleshooting	31
Error Messages	34

4: Service Information	38
Getting Service & Support	38
Your Dealer	38
Okidata Information System Automated Attendant	38
Okidata Customer Support Professionals)	39
Okidata Service Locations	40
Purchasing Replacement Parts & Accessories	41
Accessories	42
OkiLAN Model 6100e Ethernet Network Interface Card	42
OKI Adapter Card	42
Replacement Parts	42
A: Specifications	44
General Specifications	44
Font Specifications	45
Reliability	46
Paper Specifications	46
Front Feed	46
Rear Feed	47
Physical Specifications	47
Environmental Specifications	47
Electrical Specifications	48
Memory	48
B: Interfacing	49
Parallel Interface	49
Parallel Interface Pin Assignments	49
Serial Interface	51
Serial Interface Pin Assignments	51
Commonly Used Serial Cable Configurations	52
Serial Interface Test	53
Ethernet 10/100 BaseT Interface	54
Pin Assignments	54
Print Server Parallel Output Pin Assignments	55

C: Command Summary	56
Epson FX Command Summary	56
IBM Proprinter III Command Summary	69
Okidata Microline Standard Command Summary	79
Bar Code Commands	91
Select Bar Code Type and Size Command	91
Print Bar Code Data Command	93
Postnet Bar Code Command	93
Custom Font Commands: Epson & IBM	94
Epson FX Custom Font Command	94
IBM Proprinter III Custom Fonts Command	96
Select Menu Item 1 Command	98
Select Menu Item 2 Command	105
D: Hex Dump Mode	111
Running a Hexadecimal Dump	111
E: Character Sets	112
Lower ASCII Character Sets	112
Upper ASCII Character Sets	116
Epson International Character Substitutions	120
IBM International Character Substitutions	120
Microline Standard International Character Substitutions	121
Code Page Character Sets	122
IBM Multilingual Code Page Sets	126
Multilingual 858 Code Page Character Set	128
ISO 8859-15 Code Page Character Set	128
Epson BRASCII Character Set	128
Epson Abicomp Character Set	128
OKI Block Graphics Character Set	129
Bar Codes	130
UPC A	130
UPC E	130
EAN 8	130
EAN 13	130
Code 39	130
Code 128	130
Interleaved 2 of 5	130
Postnet	130

FCC / IC / CE	131
FCC Declaration of Conformity	131
Federal Communications Commission Radio Frequency Interference Statement.....	132
Industry Canada Radio Interference Statement.....	132
European Union Council of the European Communities Statement of Electromagnetic Conformance.....	132
Warranty	133
Limited Warranty	133
On-Site Repair	133
Index	135

1: Front Panel

Print Mode: Indicator Lights

Power Light:

On/off: printer on/off.

Alarm Light:

On: printer error such as paper out, paper jam, etc.

Blinking: printer error such as ROM/RAM error, spacing error, etc.



Status Light:

On: printer is ready to receive data

Blinking: printer in Print Suppress mode

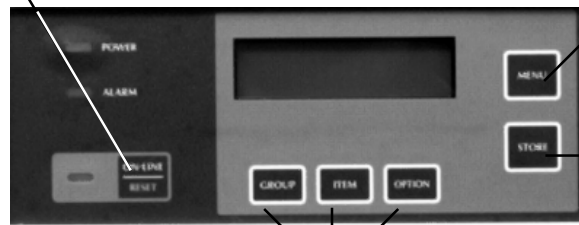
Print Mode: Control Panel Buttons

ON-LINE/RESET Button:

Press: switches printer on/off line.

With SHIFT, hold to reset printer.

With SHIFT and printer off-line, press to initialize printer.



MENU Button:

Press to enter Menu mode.

STORE Button:

No function during printing

GROUP / ITEM / OPTION Buttons:

For use in Menu Mode.

CONFIG Button:

With printer off-line and no data being sent: press to switch between menu configurations CFG1 and CFG2.
See Section 1 for information on how to set CFG1 and CFG2.

FF/LOAD/Micro Feed Up Button:

Press to move paper to next Top of Form.

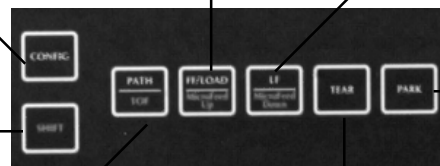
If paper is parked, press to feed paper into print position.

With SHIFT, press for fine line feeds (1/144-inch increments).

LF/Micro Feed Down Button:

Press to execute line feed.

With SHIFT, press for reverse fine line feeds (1/144-inch increment).



SHIFT Button:

Press and hold to engage alternate (lower) button functions.

PARK Button:

Press to park continuous form currently in paper path.

PATH/TOF Button:

With printer off-line:

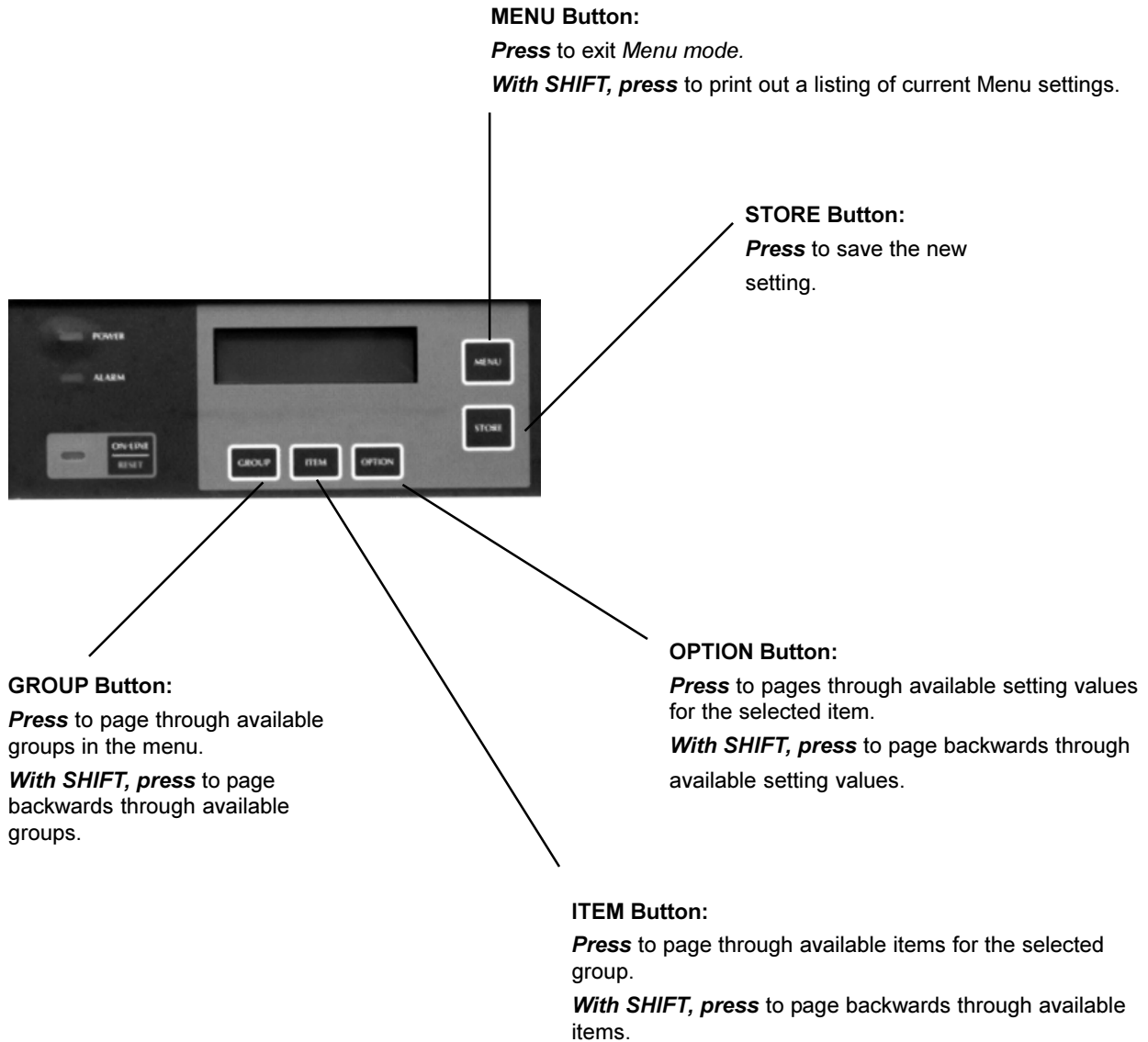
Press to switch paper paths.

Hold to set current paper position as Top of Form.

TEAR Button:

Press to move form up to tear position

Menu Mode: Control Panel Buttons



Menu Mode: Configuring Your Printer

Entering/Exiting the Menu Mode

To enter or exit the menu mode, press MENU.

Changing the Menu Settings

To change menu settings:

1. Press **MENU** to place the printer in the menu mode.
2. Press **GROUP** until the group in which you wish to make a change appears on the second line of the display.
3. Press **ITEM** until the item which you wish to change appears on the display.
4. Press **OPTION** until the value you wish to set for that item appears on the second line of the display.
5. Press **STORE** to save the setting.
An asterisk () will appear next to the value on the display.*
6. Repeat steps 2 through 5 for each item you wish to change in the menu.
7. Press **MENU** to exit the menu mode.

For example, to change to 12 cpi pitch:

1. Press **MENU**.
2. Press **GROUP** until Font appears on the display.
3. Press **ITEM** until Pitch appears on the display.
4. Press **OPTION** until 12 CPI appears on the display.
5. Press **STORE**.
An asterisk () appears next to 12 CPI.*
6. Press **MENU**.

Saving Configurations

You can establish two user-defined groups of menu settings—CFG1 and CFG2—then switch back and forth between them.

When you first start up your printer, both CFG1 and CFG2 are set to the same settings as the factory settings. You will see CFG1 (Configuration 1) at the end of the second line of the printer display.

If you enter the menu and change settings, the new settings will automatically be stored under the configuration—CFG1 or CFG2—which appears on the second line of the display when you make the changes.

You can change either CFG1 or CFG2 back to the factory settings at any time: see “Resetting the Menu” below.

Note: The following menu items cannot be set separately for CFG1 and CFG2:
Registration 1 through Registration 7 in the Set-Up group.

Switching Back and Forth between Configurations

To switch from CFG 1 to CFG 2, or vice versa:

1. Press **ON-LINE/RESET** to place the printer off-line.
2. Press **CONFIG**.
The CFG designation on the second line of the display changes.
3. Press **ON-LINE/RESET** to place the printer back on-line.
The new CFG designation appears on the second line of the display.

Resetting the Menu

You can reset the menu to the original factory settings, or engage one of the user-set values—CFG1 or CFG2—as the default.

To switch to a particular set of values, turn the printer off then:

To engage:	Press and hold while turning printer on:
Factory Settings	OPTION + STORE
CFG1 Settings as default	GROUP + ITEM
CFG2 Settings as default	ITEM + OPTION

Printing a List of Menu Items

To print out a listing of the current menu settings:

1. Press **ON-LINE/RESET** to place the printer off-line.
2. Press **MENU** to enter the menu.
3. Press **SHIFT** and **MENU** at the same time.
The menu prints.
4. Press **ON-LINE/RESET** to exit the menu and place the printer back on-line.

Summary of Menu Settings

Note: Factory settings are indicated by *bold italics*.

Group	Item	Settings
Printer Control	Emulation Mode	<i>IBM-PPR</i> , EPS-FX, OKI-ML
Font	Print Mode	<i>Utility</i> , NLQ Courier, NLQ Gothic, HSD
	Pitch	<i>10 CPI</i> , 12 CPI, 15 CPI, 17.1 CPI, 20 CPI
	Prop. Spacing	<i>No</i> , Yes
	Style	<i>Normal</i> , Italics
	Size	<i>Single</i> , Double
Symbol Sets	Character Set	<i>Set I (IBM/Epson)</i> , Set II (IBM/Epson), Standard (ML), Line Graphics (ML), Block Graphics (ML)
	Language Set	<i>American</i> , French, German, British, Danish I, Swedish, Italian, Spanish I, Japanese, Norwegian, Danish II, Spanish II, Latin American, French Canadian, Dutch, Publisher
	Zero Character	<i>Slashed</i> , Unslashed
	Code Page	<i>USA</i> , Canada French, Multilingual, Portugal, Norway, BRASCII, Abicomp, Multilingual 858, ISO 8859/15
Rear Feed	Line Spacing	<i>6 LPI</i> , 8 LPI
	Form Tear-Off	<i>Off</i> , 500ms, 1 sec, 2 sec
	Skip Over Perf.	<i>No</i> , Yes
	Page Width	<i>13.6"</i> , 8"
	Page Length	<i>11"</i> , 11-2/3", 12", 14", 17", 3", 3.5", 4", 5", 5.5", 6", 7", 8", 8.5"

Group	Item	Settings
Front Feed	Line Spacing	6 LPI, 8 LPI
	Form Tear-Off	Off, 500ms, 1 sec, 2 sec
	Skip Over Perf.	No, Yes
	Page Width	13.6", 8"
	Page Length	11", 11-2/3", 12", 14", 17", 3", 3.5", 4", 5", 5.5", 6", 7", 8", 8.5"
Set-Up	Graphics	Bi-directional, Uni-directional
	# Graphic Bits [ML emulation only]	8, 7
	Rcv. Buffer	1 Line, 16K, 28K, 56K (No DLL)
	Ppr Out Override	No, Yes
	Registration 1	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.
	Registration 2	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.
	Registration 3	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.
	Registration 4	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.
	Registration 5	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.
	Registration 6	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.

Group	Item	Settings
Set-Up (cont.)	Registration 7	0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, 0.05 mm Right, 0, 0.05 mm Left, 0.10 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left.
	Data Word Size [ML emulation only]	8, 7
	Op. Panel Function	Full Operation, Limit Operation
	Reset Inhibit	No, Yes
	Print Suppress	No, Yes
	Auto LF	No, Yes
	Auto CR [ML emulation only]	No, Yes
	Print DEL Code [ML emulation only]	No, Yes
	SI Pitch (10) [IBM emulation only]	15 CPI, 17.1 CPI
	SI Pitch (12) [IBM emulation only]	12 CPI, 20 CPI
	Time Out Print	Valid, Invalid
	Auto Select	No, Yes
	ESC SI Pitch [IBM emulation only]	17.1 CPI, 20 CPI
	Intr Chr Sub St [Epson emulation only]	Combined, Code Page Only
	Host Interface	Auto Interface, Parallel, Serial, OKI HSP (print server installed), Opt. Card (optional card installed)
	I/F Time Out	15 sec, 30 sec, 45 sec, 1 min, 2 min, 3 min, 4 min, 5 min
	Default Path	Current Path, Rear Path, Front Path
	Auto Path	Invalid, Valid
	Impact Mode	Normal, Quiet, Hi-Impact Copy

Group	Item	Settings
Set-Up (cont.)	LF Speed Width Control	Fast, Slow Invalid, Mode 1, Mode 2
Parallel I/F	I-Prime	Invalid, Buffer Print, Buffer Clear
	Pin 18	+5V, Open
	Auto Feed XT [Epson emulation only]	Valid, Invalid
	Bi-Direction	Enable, Disable
Serial I/F	Parity	None, Odd, Even
	# Serial Bits	8 Bits, 7 Bits
	Protocol	Ready/Busy, X-ON/X-OFF
	Diagnostic Test	No, Yes
	Busy Line	SSD-, SSD+, DTR, RTS
	Baud Rate	9600 BPS, 4800 BPS, 2400 BPS, 1200 BPS, 600 BPS, 300 BPS, 19200 BPS, 38400 BPS
	DSR Signal	Valid, Invalid
	DTR Signal	Rdy on Pwr Up, Ready on Select
	Busy Time	200 ms, 1 sec

Explanation of Menu Settings

The items in the table below are arranged in alphabetical order.

Item	Description	Emulations	Group(s)
# Graphic Bits	Choose the graphics your system uses: 7 or 8 dots in each column printed.	ML only	Set-Up
# Serial Bits	Change to 7 Bits if your system uses a 7-bit data format.	All	Serial I/F
Auto CR	If you want the printer to automatically add a carriage return when a Line Feed is received at the end of a line, change the setting to Yes.	IBM only	Set-Up
Auto Feed XT	If your system uses pin 14 of the parallel interface to control automatic line feed, change the setting to Valid.	Epson only	Parallel I/F
Auto LF	If your printout is consistently double spaced, select No; if it overprints, select Yes.	All	Set-Up
Auto Path	Invalid = paper path controlled by software; Valid = paper path controlled by printer; paper automatically switches to the alternate path when current paper runs out.	All	Set-Up
Auto Select	If you always use the same Top of Form position, change the setting to Valid.	All	Set-Up
Baud Rate	Sets the data transmission speed for the serial interface.	All	Serial I/F
Bi-Direction	Change to disable if you wish to disengage bi-directional communication at the parallel interface.	All	Parallel I/F
Busy Line	If the Ready/Busy protocol (factory setting) is selected, use this to select which line your system monitors for a busy signal.	All	Serial I/F
Busy Time	Sets the length of the busy signal when the Ready/Busy protocol (factory setting) is engaged.	All	Serial I/F
Character Set	Determines the character set the printer uses.	All	Symbol Sets
Code Page	Sets the Code Page set the printer uses: which selections appear depends on the emulation selected.	All	Symbol Sets

Item	Description	Emulations	Group(s)
Data Word Size	If your computer system uses seven bits to make up each unit of data, change this setting to 7.	ML only	Set-Up
Default Path	Change to Rear Path or Front Path if you wish the printer to use that paper path as its default.	All	Set-Up
Diagnostic Test	Change to Yes if you want to perform a diagnostic test of the serial interface (see Appendix B: Interfacing).	All	Serial I/F
DSR Signal	Used with Ready/Busy protocol (factory setting) to determine the way your system handles the DSR (Data Set Ready) signal.	All	Serial I/F
DTR Signal	Change to Ready on Select if the DTR (Data Terminal Ready) signal is required when the printer is selected; leave as Ready on Power Up if the DTR signal is required when the printer is turned on.	All	Serial I/F
Emulation Mode	Sets the printer emulation.	Not applicable	Printer Control
ESC SI Pitch	Sets the character pitch used when the ESC SI command is received by the printer.	IBM only	Set-Up
Form Tear-Off	Select 500 ms, 1 second, or 2 seconds to turn the Form Tear-Off feature on and to set the time interval for the printer to wait before advancing the paper to the tear-off position.	All	Rear Feed, Front Feed
Graphics	Change to uni-directional printing to improve alignment between print lines when printing graphics. This will slow down the printing. Alternately, you can leave Bi-directional enabled and optimize graphics printing by adjusting the print registration setting in the Set-Up group.	All	Set-Up

Item	Description	Emulations	Group(s)
Host Interface	If you wish to select a dedicated interface rather than having the printer automatically detect the interface being used, select parallel, serial, OKI HSP (appears only if the print server is installed), or Opt. Card (appears only if optional card is installed).	All	Set-Up
I/F Time Out	Sets the length of time the printer will wait for additional data to be received at the interface.	All	Set-Up
Impact Mode	Change to Quiet for minimum sound; change to Hi-Impact Copy for forms thicker than 7-part carbonless.	All	Set-Up
Intr Chr Sub St	International Character Sub Set: change to Code page Only if you wish the printer to ignore the Language Set.	Epson only	Set-Up
I-Prime	Determines what the printer will do when it receives the I-Prime signal from the software: Buffer Print prints out the buffer contents before resetting; Buffer Clear dumps the buffer contents immediately. Invalid causes the printer to ignore the I-Prime command.	All	Parallel I/F
Language Set	Replaces certain standard symbols with special characters used in foreign languages.	All	Symbol Sets
LF Speed	Change to Slow if you wish to reduce the speed with which the printer executes the line feed command when using thicker forms.	All	Set-Up
Line Spacing	Change to 8 lines per inch to get more lines per page.	All	Rear Feed, Front Feed
Op. Panel Function	Operator Panel Function: Change to Limited Operation to deactivate the MENU, GROUP, ITEM, OPTION, STORE and CONFIG buttons. This prevents these from being changed from the control panel when several people are using the printer.	All	Set-Up
Page Length	Sets the length of the continuous forms you are using.	All	Rear Feed, Front Feed

Item	Description	Emulations	Group(s)
Page Width	<p>Change to 8" if you are using 9-inch continuous forms. For continuous forms less than 9 inches wide, the page width must be set using software.</p> <p><i>Caution! If the page width is set narrower than the continuous forms being used, the printhead will print directly on the platen: this can damage the printhead.</i></p>	All	Rear Feed, Front Feed
Parity	Sets the type of parity your system uses.	All	Serial I/F
Pin 18	Sets the signal on pin 18 of the parallel interface to +5 volts or to open.	All	Parallel I/F
Pitch	Sets the character width in characters per inch.	All	Font
Ppr Out Override	Paper Out Override: Senses when less than 1" (25 mm) of paper remains and stops printing. Change to Yes to override the sensor. <i>Caution!! This can cause loss of data and damage the printhead!</i>	All	Set-Up
Print DEL Code	Change to Yes if you wish to print the DEL code (decimal 27) as a solid box.	ML only	Set-Up
Print Mode	Sets the typeface used: Utility, NLQ (Near letter Quality) Courier, NLQ (Near Letter Quality) Gothic, or HSD (High Speed Draft).	All	Font
Print Suppress	If you wish to enable the print suppress command, change the setting to Yes. If you select Yes, the printer will ignore all data after it receives the print suppress command.	All	Set-Up
Prop. Spacing	Change to yes if you wish to engage proportionally spaced printing.	All	Font
Protocol	Switch to X-ON/X-OFF if that is the serial interface protocol you are using.	All	Serial I/F
Rcv. Buffer	Sets the size of the receive buffer.	All	Set-Up

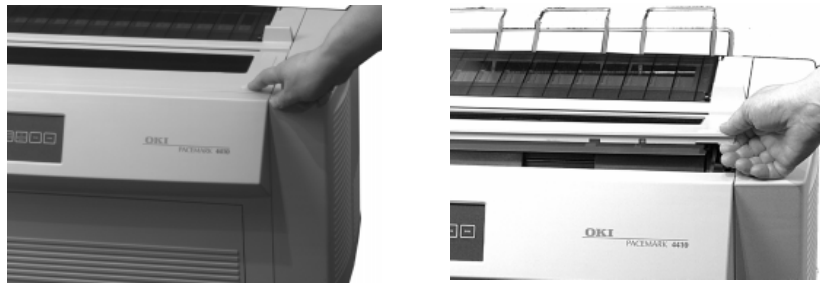
Item	Description	Emulations	Group(s)
Registration 1 through Registration 7	Change the setting as required to obtain the best registration for bi-directional printing. Each time you press OPTION, the next setting appears on the display and the printer prints a sample showing the alignment for that setting. Press STORE to select the setting with the best alignment (asterisk appears next to the setting) before exiting the menu.	All	Set-Up
Reset Inhibit	Change to Yes to prevent your software from resetting your printer's settings.	All	Set-Up
SI Pitch (10)	Sets the pitch to be engaged when the printer control panel is set for 10 cpi and the SI command is received.	IBM only	Set-Up
SI Pitch (12)	Sets the pitch to be engaged when the printer control panel is set for 12 cpi and the SI command is received.	IBM only	Set-Up
Size	Change to Double for double width and height printing.	All	Font
Skip Over Perf.	Change to Yes if you want the printer to go to the next page when it comes within 1" (25 mm) of the bottom of the page. Keep it set to No if your software has its own page formatting controls.	All	Rear Feed, Front Feed
Style	Change to italics if you want the printed characters to be slanted.	All	Font
Time Out Print	If your software spends a long time processing between portions of data it feeds to the printer, change the setting to Invalid to keep your printer from printing the received data while it is waiting for more.	All	Set-Up
Width Control	Used to limit printhead travel. Select Mode 1 to wrap print lines which exceed the width of the paper. Select Mode 2 to cut off the end of print lines which exceed the width of the paper.	All	Set-Up
Zero Character	If you do not want the printer to use a slash to distinguish a zero from the capital letter O, change the setting to Unslashed.	All	Symbol Sets

2: Maintenance

Replacing the Ribbon

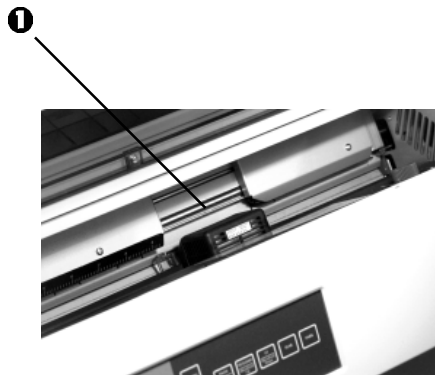
Remove the Old Ribbon

1. Turn the printer off, then press on the area(s) marked PUSH and open the printhead access cover.

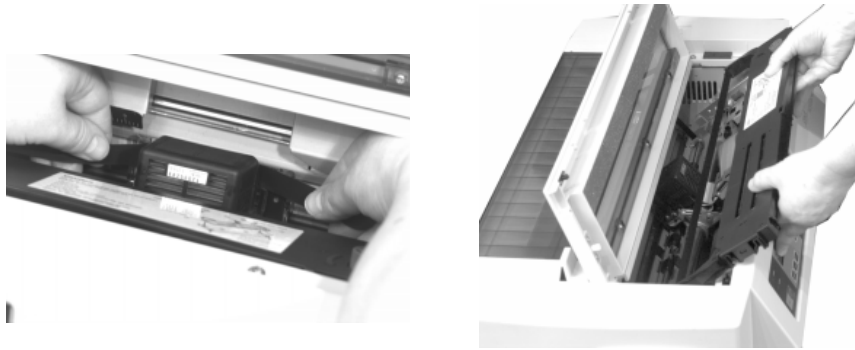


Caution! The printhead may be extremely HOT!

2. Move the printhead to the ribbon loading area (1).



3. Unthread the ribbon from the printhead, then remove and discard the cartridge.



Prepare the New Ribbon

1. Open the new ribbon cartridge and swing out the ribbon arms at either end of the ribbon cartridge until they snap into place.



2. Push in on the white plastic ribbon restraint at the right end of the cartridge.



3. Pull out the red shipping restraint.



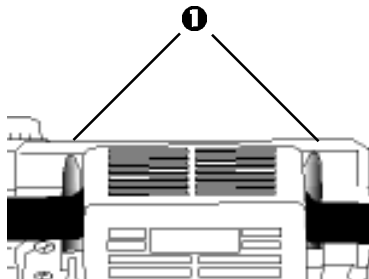
Install the New Ribbon

1. Install the ribbon cartridge in the printer: place the ribbon arms over the metal tabs at either end, then press down on the cartridge.

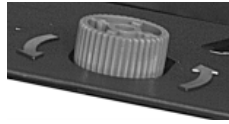


2. Feed the ribbon over the back of the printhead, threading it into the black guides (1) on either side of the printhead.

Caution! Be careful not to twist the ribbon: this can cause jams.



3. Turn the blue knob counter clockwise (in the direction of the molded arrows) to take up any slack in the ribbon, then close the printhead access cover.



Caution! Do NOT turn the knob clockwise: this can cause the ribbon to jam!

Clearing Paper Jams

Front Feed Jams

To clear a front feed paper jam:

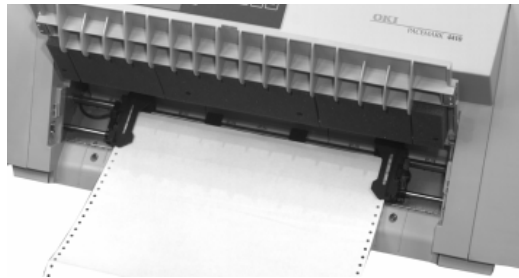
1. Press PARK to retract the paper from the paper path.
2. Turn the printer off.
3. Pull the front access door out and lift it up into the open position.



4. Open the tractor pin covers and remove the jammed paper. Be careful to remove any ripped pieces.



5. Tear off two or three forms to ensure a clean, unwrinkled form, then reload the continuous forms on the pins and close the tractor pin covers.



6. Close the front access door and turn the printer on.
7. Press FF/LOAD to load the paper into the print path.

If the paper continues to jam...

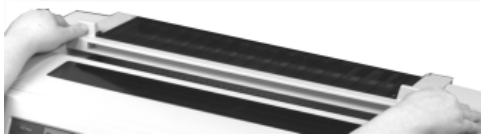
If you continue to experience paper jams, there are probably some inaccessible pieces stuck in the paper path. To correct this:

1. Press the **PARK** button to retract the paper from the paper path.
2. Open the front access door.
3. Fold some continuous forms paper over three times to form a thick “sheet,” then load the sheet on the tractors, and press **FF/LOAD**. The sheet will feed into the printer, pulling any loose pieces through the path and out into the printhead area.
4. Remove the pieces, then press **FF/LOAD** and remove the thick paper.
5. Reload your regular continuous forms and close the front access door.
6. Press **FF/LOAD**.

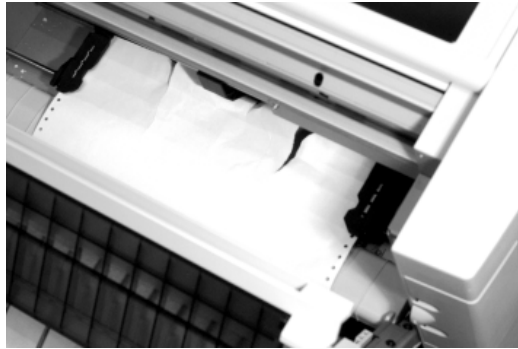
Rear Feed Jams

To clear a rear feed paper jam:

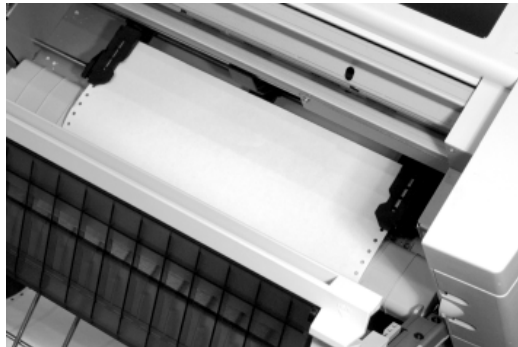
1. Press **PARK** to retract the paper from the paper path.
2. Turn the printer off.
3. Push on the rear-feed access cover tabs and swing the cover back.



4. Open the tractor covers and remove the jammed paper. Be careful to remove any ripped pieces.



5. Tear off two or three forms to ensure a clean, unwrinkled form, then reload the continuous forms on the pins and close the tractor covers.



6. Close the rear-feed access cover and turn the printer on.
7. Press **FF/LOAD** to load the paper into the printing path.

If the paper continues to jam...

If you continue to experience paper jams, there are probably some inaccessible pieces stuck in the paper path. To correct this:

1. Press the **PARK** button to retract the paper from the paper path.
2. Open the rear-feed access cover.
3. Fold some continuous forms paper over three times to form a thick “sheet,” then load the sheet on the tractors, and press **FF/LOAD**. The sheet will feed into the printer, pulling any loose pieces through the path and out into the printhead area.
4. Remove the pieces, then press **FF/LOAD** and remove the thick paper.
5. Reload your regular continuous forms and close the rear-feed access cover.
6. Press **FF/LOAD**.

Replacing the Power Fuse

To replace the power fuse:

1. Turn the printer off and unplug it from the outlet.
2. Turn the fuse housing (1) to the left and remove it from the printer.



3. Replace the fuse and reinstall the fuse housing in the printer.
4. Plug the printer back in and turn it on.

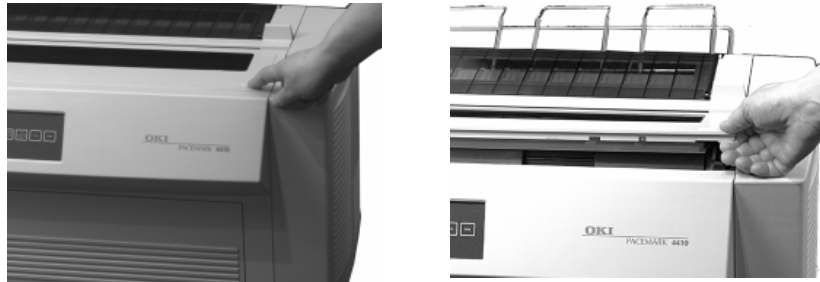
Cleaning the Housing

You should clean the housing every few months (or after about 300 hours of operation).

Caution! *Never use solvents or strong detergents on the cabinet: they could damage the housing.*

Cleaning the Interior

1. Press **PARK** to remove the paper from the print path.
2. Turn the printer off.
3. Press on the area(s) marked PUSH and open the printhead access cover.



4. Use a clean, dry cloth to dust around inside the printer. Remove any loose bits of paper.



5. Close the printhead access cover.

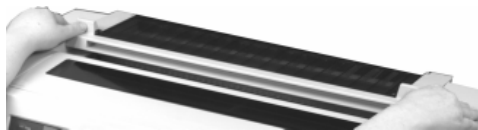


6. Pull out the front access cover and lift it into the open position.



7. Vacuum out any paper dust and loose bits of paper, then close the cover.

8. Open the rear-feed access cover and vacuum out any paper dust and loose bits of paper, then close the cover.



9. Turn the printer back on and press FF/LOAD to load paper back into the print path.

Cleaning the Exterior

Use a damp cloth with a mild detergent to wipe the printer's external housing clean.

3: Troubleshooting

General Troubleshooting

Problem:

Nothing happens when I turn on the printer.

Solutions:

1. Check the power cord connection to the outlet.
2. If you are using a power strip, make sure it is turned on and that the fuse has not blown nor the circuit breaker tripped.
3. Check the fuse (1) at the back of the printer:



Problem:

The printer does not print when the computer sends data.

Solutions:

1. Is the Status light on? If not, press **ON-LINE/RESET**.
2. Check that the interface cable is securely connected to both the printer and to the computer or network.
3. If you have the optional accessory card installed, make sure it is firmly seated in the printer.

Problem:

I'm getting strange symbols, incorrect fonts, etc.

Solution:

1. Check to be sure that the printer driver you have selected in your software matches the printer emulation.
2. If you have embedded any printer commands in your software, check to be sure that you entered them correctly.

Problem:

The MENU, GROUP, ITEM, OPTION and STORE buttons on the front panel won't work.

Solution:

The Op. Panel Function in the printer menu can be used to disable these buttons. If the printer is part of a customized system or if it is used by a number of people, the system manager may have used this option to make sure the printer is always set properly.

Problem:

The files I send do not print the way I have the menu and front panel set.

Solution:

Before sending a file to the printer, the software may be sending either an "initialization string" or an I-Prime signal to the printer.

The initialization string contains codes that override the panel and menu settings. To change the printer to ignore the reset code, press MENU to enter the menu mode, go to the Set-Up group and change the setting for the Reset Inhibit item to Yes (see Section 1 for more information on changing menu settings).

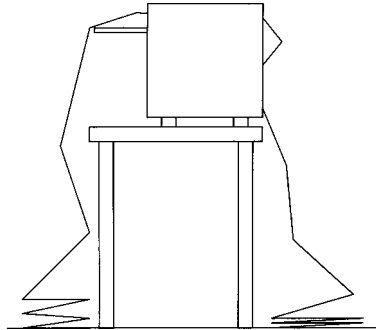
The I-Prime signal will automatically override any front panel settings you have made. To eliminate this problem, press MENU to enter the menu mode, go to the Parallel I/F group and change the setting for I-Prime to Invalid (see Section 1 for more information on changing menu settings).

Problem:

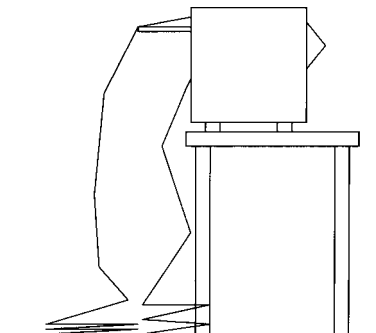
I am continuing to have paper exit jams.

Solution:

If you are using front feed, make sure that the front of the printer is flush with the edge of the table.



If you are using rear feed, make sure that the rear of the printer is flush with the edge of the table.



If you are switching paper paths on a regular basis, use a table/support for the printer which is close to the front-to-back depth of the printer so that both the front and rear of the printer can be placed flush with the edge of the support.

Problem:

The front access door won't close properly.

Solution:

Make sure that the front-feed tractor covers are properly closed.

Problem:

I'm trying to print envelopes, but they keep jamming.

Solution:

If you load continuous-form envelopes at the default position, the auto gap thickness is sensed at the envelope's flap position which is thinner than the envelope's main area. This can cause jamming when the envelopes are being printed.

The auto gap needs to be set at the thicker area of the envelope. To do this:

1. Press **FF/LOAD** to load the envelope forms into the print path.
2. Hold **SHIFT** and press **FF/LOAD/Micro Feed Up** until the bail closes.
3. Press **PARK** to remove the envelopes from the print path.
4. Press **FF/LOAD**.
5. Send one address to start the printhead moving so that the gap is automatically set for the double thickness area of the envelope.
6. Press **PARK** to remove the envelopes from the print path.
7. Hold **SHIFT** and press **PATH/TOF** to reset the Top of Form to the factory setting.
8. Press **FF/LOAD** to load the envelopes back into the print path.

Error Messages

Error Message	What to Do
AUTO GAP	Printhead gap malfunction. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
BAIL	Bail motor not functioning properly. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
CENTERING	Spacing error during centering operation. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
CG-ROM	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
COVER OPEN	Printhead access cover is open. Close it.
D-RAM	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).

Error Message	What to Do
DATA REMAIN	Data is being held in the buffer due to the fact that the printhead cover is open. Close the cover, then press ON-LINE/RESET.
EEPROM	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
EJECT JAM	Paper jammed as it was being ejected. Correct the jam and reload paper.
FEED JAM	Paper jammed during a print job as it was feeding through the printer. Clear the paper jam (see Section 2) and reload paper.
FUSE	Internal fuse has blown. Contact your service provider (see Section 4).
HEAD 1 FAN	Printhead Fan 1 is damaged. Contact your service provider (see Section 4).
HEAD 2 FAN	Printhead Fan 2 is damaged. Contact your service provider (see Section 4).
HEAD THERMAL	Printhead has overheated. Turn the printer off and wait for the printhead to cool down, then try again. If the message persists, contact your service provider (see Section 4).
HEAD THERMISTOR	Printhead thermistor is damaged. Contact your service provider (see Section 4).
HOMING	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
INVALID IPT	Illegal IPT alarm. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
LCD TIME OUT	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
LF THERMAL	The line feed motor has overheated. Turn the printer off and wait for it to cool down, then try again. If the message persists, contact your service provider (see Section 4)
LOAD JAM	Paper jammed as it was being loaded into the print path. Press PARK to remove the paper from the print path, then clear the paper jam (see Section 2) and reload paper.
MAIN LSI	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
OFF-LINE	Printer is off line (ALARM light on). Press ON-LINE/RESET when you are ready to place the printer back on line.

Error Message	What to Do
OKI HSP CONNECT	There is a problem with the OKI HSP connection. Check to be sure that the print server is properly installed and that the connection is secure. If message persists, contact your service provider (see Section 4).
OPT CARD ROM	There is a problem with the ROM on the optional interface card. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
OPT CARD CONNECT	There is a problem with the connection to the optional interface card. Check to make sure that the card is properly installed and that the connection is firm, then try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
OPTICAL SENSOR	Paper width sensor alarm. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
PAPER END	Paper has run out. Load a new stack of continuous forms.
PAPER JAM	Paper edge has ripped and caused a jam. Clear the paper jam (see Section 2) and reload paper.
PAPER RELEASE	The bail is partially open. Press SHIFT + PARK.
PARK JAM	Paper jammed as it was being parked. Clear the paper jam (see Section 2) and reload paper.
PATH CHANGE	Path switching motor is not functioning properly. Contact your service provider (see Section 4).
PATH CHANGE JAM	Paper jam during change in paper path. * 1. Check to be sure that paper is loaded in both paths. * 2. Determine which path is jammed, then clear the jam and reload paper.
POWER FAN	Power supply fan malfunction. Contact your service provider (see Section 4).
PROGRAM-ROM	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
RIBBON	Ribbon motor not functioning properly . Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).

Error Message	What to Do
RIBBON JAM	<ol style="list-style-type: none"> 1. Check to be sure that the ribbon is not twisted: open the printhead access cover, remove the ribbon from around the printhead and reload it around the printhead and guides, making sure that it does not get twisted as you load it. 2. Remove the ribbon from the printer, turn the take-up knob counter clockwise (in the direction of the molded-on arrows) a few times, then re-install it (see Section 2). 3. If this does not clear the problem, try installing a new ribbon.
SP THERMAL	The spacing motor has overheated. Turn the printer off and wait for it to cool down, then try again. If the message persists, contact your service provider (see Section 4)
SPACE FAN	Spacing motor fan malfunction. Contact your service provider (see Section 4).
SPACING	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
S-RAM	Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).
WDT	Watch dog time-out alarm. Try turning the printer off, then on again. If message persists, contact your service provider (see Section 4).

4: Service Information

Getting Service & Support

Note: For the latest information on getting service and support, consult our multilingual web site (English, French, Spanish, Portuguese): **<http://www.okidata.com>**

Your Dealer

Consult the store where you purchased your printer, or in the U.S. and Canada, call 1-800-OKIDATA (1-800-654-3282) for the location of the nearest Authorized Okidata Service Dealer. Have your ZIP code ready.

- Proof of purchase is required for warranty work. Be sure to retain your purchase documents.

Okidata Information System Automated Attendant 1-800-OKI-DATA (1-800-654-3282)

U.S and Canada only.

For automated customer support information, call 1-800-OKI-DATA (1-800-654-3282). The Okidata Information System Automated Attendant is available 24 hours a day, seven days a week, and can provide immediate assistance with:

- Sales and service referrals
- Parts and supplies referrals
- Product information
- Access to Faxable Facts retrieval system

1-800-OKI-DATA (1-800-654-3282) also provides access to our Okidata Customer Support Professionals.

Okidata Customer Support Professionals 1-800-OKI-DATA (1-800-654-3282)

U.S and Canada only.

Our Customer Support staff is available 24 hours a day, 7 days a week. Please be sure that you are calling from a telephone close to your printer so you can describe your problem accurately.

Our Customer Support Professionals are trained on all current OKI products. They can answer your questions regarding:

- Locations of Sales & Service Dealers
- Installation of your OKI printer
- Usage/normal maintenance of your printer
- Availability/installation of printer drivers
- Error message interpretation/solutions
- Parts and Supplies identification
- Consumer relations

Note: Customer Support Professionals are not trained to provide assistance with the use of commercial software packages. Please consult your software users manual for times and availability of the manufacturers support.

Okidata Service Locations

If repair to your printer becomes necessary, the repair can be handled by one of Okidata's many repair facilities.

In the U.S. and Canada

Before shipping your printer, call 1-800-OKI-DATA (1-800-654-3282) for a return authorization number. Select the "service" option to find an appropriate service depot.

After receiving your return authorization number, you will be given directions for shipping your product to one of our repair facilities.

- Allow 10 days for round trip shipping repair via a depot.
- Carry-in repairs must be called in first to schedule service.

In Latin America

Before shipping your printer, call one of the service centers listed below. For a complete listing of all available service centers in Latin America, consult the Spanish and Portuguese sections of our multilingual web site at <http://www.okidata.com>.

Service Location Listings

United States

Oki Data Americas, Inc.

Phone 1-800-654-3282

Fax 1-609-222-5247

Canada

Oki Data Americas, Inc.

Phone 1-800-654-3282

Fax 1-905-238-4427

Brazil

Oki Data do Brasil, Ltda.

Phone (5511) 5589-1518

Fax (5511) 5584-0267

Mexico

Oki Data de mexico, S.A. de C.V.

Phone 525-661-6860

Fax 525-661-5861

Purchasing Replacement Parts & Accessories

Before you order, know your printer model number (Pacemark 4410) and have the correct part number and description of the item

Ways to Purchase

- Consult the dealer where you purchased your printer
- Consult an Okidata Authorized Sales or Service Dealer.
In the U.S. and Canada, call 1-800-OKIDATA (1-800-654-3282) for the nearest Authorized Sales and Service location. Have your ZIP code ready for our Customer Support Representatives.
- In the U.S., order toll-free by phone at 1-800-OKIDATA (1-800-654-3282), using VISA®, MasterCard®, or American Express®.
- In Canada, call 905-602-6400 to order parts: VISA and American Express are accepted.
- Check office supply catalogs or your local stationery store. Most carry Okidata brand ribbons. Be sure to ask for genuine Okidata ribbons!

Accessories

Note: For the latest available accessories for the Pacemark 4410 printer, check our web site — <http://www.okidata.com>.

OKiLAN® Model 6100e Ethernet® Network Interface Card, P/N 70034201

For Pacemark 4410 non-network version only. Installs in the network/option slot to convert the printer for use in network environments.

OKI Adapter Card

For Pacemark 4410 non-network version only. This card installs in the network/option slot to allow use with third-party options such as Twinax/Coax boards. For more information, check our web site — <http://www.okidata.com> — or call 1-800-OKI-DATA (1-800-654-3282).

Replacement Parts

Fuse, 120 volt Order # 56305901

Paper Guide



..... Order # 40658201

Power Cords

120 volt Order # 56631801

220 volt Order # 56631901

Printhead Access Cover



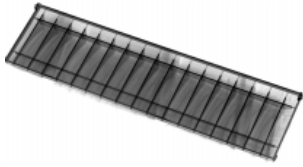
..... Order # 40520201

Ribbon Cartridge



..... Order # 40629302

Tear Bar Cover



..... Order # 40519801

A: Specifications

General Specifications

Print Method: Serial impact dot matrix

Printhead: Two rows of nine pins in a single-head diamond configuration

Graphics Resolution (Maximum)

Microline Standard Mode: 288 dpi horizontal x 144 dpi vertical

Epson/IBM Modes: 240 dpi horizontal x 216 dpi vertical

Print Speed

Mode	Characters per Inch	Speed , Characters per Second
HSD (High Speed Draft)	10 cpi	1066 cps
	12 cpi	1066 cps
	15 cpi	1066 cps
	17.1 cpi	1066 cps
	20 cpi	1066 cps
Utility	10 cpi	800 cps
	12 cpi	800 cps
	15 cpi	800 cps
	17.1 cpi	800 cps
	20 cpi	800 cps
NLQ (Near Letter Quality)	10 cpi	200 cps
	12 cpi	200 cps
	15 cpi	200 cps
	17.1 cpi	200 cps
	20 cpi	200 cps

Characters per Line

Setting, Characters per Inch	Characters per Line
10 cpi	136 cpl
12 cpi	163 cpl
15 cpi	204 cpl
17.1 cpi	233 cpl
20 cpi	272 cpl

Emulations: Epson FX, IBM Proprinter III, Okidata Microline Standard

Interface

Model 4410

Standard: Centronics parallel IEEE-1284, Nibble Mode
RS-232C 25-pin Serial, 38.4 KBps maximum baud rate

Optional: OkiLAN 6100e EtherNet® Network Print Server

Model 4410 Network Ready

Standard: Centronics parallel IEEE-1284, Nibble Mode
RS-232C 25-pin Serial, 38.4 KBps maximum baud rate
OkiLAN 6100e EtherNet® Network Print Server

Font Specifications

Mode/Type	Available Fonts
NLQ (Near Letter Quality)	Courier, Gothic
Utility	Gothic
HSD (High Speed Draft)	Gothic
Scalable Fonts (22 to 216 point)	Courier, Gothic
Bar Code Fonts	Code 39, UPC A, UPC E, EAN 8, EAN 13, Interleaved 2 of 5, Code 128, PostNet

Reliability

Parameter	Reliability
Mean Time Between Failures (MTBF)	15,000 hours at 25% duty cycle and 35% page density
Mean Time to Repair (MTTR)	15 minutes, major subassembly level
Printhead Life	400 million characters average in 10 cpi utility mode at 25% density and 35% page density
Ribbon Life (on average, 10 cpi utility)	15 million characters

Paper Specifications

Front Feed

Maximum thickness: 0.031 inches (0.79 mm)

Type	Weight	Thickness	Width
Single Part	12 to 24 lb. (45 to 90 g/m ²)	0.031 inch (0.79 mm)	3* to 16½ inches (76 to 419 mm)
Carbonless (1 + 9 max.)** (34 to 40 g/m ²)	9 to 11 lb. (0.79 mm)	0.031 inch (76 to 419 mm)	3* to 16½ inches
Interleaf (1 + 6 max)	9 to 14 lb. paper (34 to 52 g/m ²) 9 lb. carbon (34 g/m ²)	0.031 inch (0.79 mm)	3* to 16½ inches (76 to 419 mm)
Labels	N.A.	0.011 inch (0.28 mm)	3¼ to 15 inches (83 to 381 mm)
Envelopes	24 lb. (90 g/m ²) max.	0.014 inch (0.36 mm)	3 to 10 inches (76 to 254 mm)
Card Stock	100 lb. (375 g/m ²) max.	0.008 inch (0.20 mm)	3 to 8 inches (76 to 203 mm)

* For paper widths less than 5 inches (127 mm), remove the support between the tractors.

** When using forms thicker than 7-part carbonless or its equivalent, you must enter the Menu mode, then go to the **Impact Mode** item in the **Set-Up** group and select **High-Impact Copy** as the setting.

Rear Feed

Maximum thickness: 0.014 inches (0.36 mm)

Type	Weight	Thickness	Width
Single Part	12 to 24 lb. (45 to 90 g/m ²)	0.014 inches (0.36 mm)	3* to 16½inches (76 to 419 mm)
Carbonless (1 + 5 max.)	9 to 11 lb. (34 to 40 g/m ²)	0.014 inches (0.36 mm)	3* to 16½ inches (76 to 419 mm)
Interleaf (1 + 3 max)	9 to 14 lb. paper (34 to 52 g/m ²) 9 lb. carbon (34 g/m ²)	0.014 inches (0.36 mm)	3* to 16½ inches (76 to 419 mm)

* For paper widths less than 5 inches (127 mm), remove the support between the tractors.

Physical Specifications

Dimensions

Width: 30¼ inches (768 mm)

Depth: 15-5/32 inches (385 mm)

Height: 14-7/8 inches (378 mm)

Weight: 92.6 lbs (42 kg)

Environmental Specifications

Temperature

Operating: 41 to 95°F (5 to 35°C)

Storage: 14 to 109°F (-10 to +43°C)

Relative Humidity

Operating: 20 to 80% RH (Maximum wet bulb temperature 30°C)

Storage: 5 to 95% RH (Maximum wet bulb temperature 40°C)

Electrical Specifications

Voltage: 90 to 264 Volts, AC, universal

Frequency: 50 or 60 Hz, $\pm 2\%$

Power Consumption

Idling: Less than 15 watts

Local Test: About 295 watts

Memory

ROM: two x 512 KB EPROM

RAM:

Resident: 512KB

Receive Buffer Size: 28KB maximum (56KB maximum, no DLL)

DLL: 27.75KB maximum (NLQ = 2 x 12KB; UTL = 3.25K)

B: Interfacing

Parallel Interface

The parallel interface is standard IEEE 1284 bi-directional with a 36-pin, Amphenol 57-40360-12-D56 receptacle. It requires a Centronics-equivalent parallel cable with the following:

- Amphenol 57-30360 or AMP 552274-1 plug (or equivalent) with 36 pins
- AMP 552073--1 (or equivalent) cover
- UL and CSA approved shielded cable, maximum 6 feet, with twisted pair conductors.

Parallel Interface Pin Assignments

Pin No.	Signal	Return Pin	Direction
1	Data Strobe	19	To printer
2	Data Bit 1	20	To printer
3	Data Bit 2	21	To printer
4	Data Bit 3	22	To printer
5	Data Bit 4	23	To printer
6	Data Bit 5	24	To printer
7	Data Bit 6	25	To printer
8	Data Bit 7	26	To printer
9	Data Bit 8	27	To printer
10	Acknowledge	28	From printer
11	Busy	29	From printer
12	Paper End	30	From printer
13	Select	No return	From printer
14	Auto Feed		To printer

15	Unused	-	-
16	0V	No Return	-
17	Chassis Ground	No Return	-
18	+5V	-	From printer
19 to 30	0V	-	-
31	I-Prime	-	To printer
32	Fault	-	From printer
33	0V	-	-
34	Unused	-	-
35	-	-	-
36	Select-I	-	To printer

Serial Interface

The serial interface is EIA Standard RS-232C serial input, start-stop synchronization.

- **Baud Rate:** 300, 600, 1200, 2400, 4800, 9600 (default), 19,200, or 38,400 bps
- **Data Word Length:** 7 (default) or 8 bits
- **Parity:** None (default), odd, even
- **Stop Bit Length:** 1 bit or more
- **Message Buffer Length:** 8,192 bytes
- **Communication Protocol:** Ready/Busy (default) or X-ON/X-OFF

Serial Interface Pin Assignments

Pin No.	Signal	Symbol	Direction
1	Protective Ground	PG	-
2	Transmitted Data	TD	From printer
3	Received Data	RD	To printer
4	Request to Send	RTS	From printer
5	Unused	-	-
6	Data Set Ready	DSR	To printer
7	Signal Ground	SG	-
8 to 10	Unused	-	-
11	Supervisory Send Data	SSD	From printer
12 to 19	Unused	-	-
20	Data Terminal Ready	DTR	From printer
21 to 25	Unused	-	-

Commonly Used Serial Cable Configurations

IBM 25-Pin Cable Configuration

Computer	Printer
PG1 _____	1 PG
TD2 _____	3 RD
RD 3 _____	2 TD
CTS 5 _____	11 SSD
DSR 6 _____	20 DTR
	6 DSR
SG 7 _____	7 SG
	4 RTS
	5 CTS

IBM 9-Pin Cable Configuration

Computer	Printer
RD 2 _____	2 TD
TD 3 _____	3 RD
SG 5 _____	7 SG
DSR 6 _____	20 DTR
	6 DSR
CTS 8 _____	11 SSD
	4 RTS
	5 CTS

Serial Interface Test

To perform a local diagnostic test of the serial interface:

Note: To stop the test at any time, turn the printer off.

You need a test connector to jumper the following pins:

TD	2
RD	3
RTS	4
CTS	5
CD	8
SSD	11
DTR	20
DSR	6

1. Enter the printer menu and change the Diagnostic Test item in the Serial I/F group to Yes.
2. Turn the printer off.
3. Plug the test connector into the serial interface receptacle.
4. Turn the printer on:
 - The printer prints the message “LOOP TEST”
 - The printer checks the memory function of the message buffer, then prints “RAM GOOD” if the memory check is okay, or “RAM BAD” if the memory check fails.
 - The signal logic is checked. If the signal logic is okay, “I/F GOOD” prints. If it is faulty, “I/F BAD” prints.
 - Hexadecimal characters from 20 to 7E are transmitted through the TD (Transmit Data) line, and received through the RD (Receive Data) line, then written to the message buffer. The above stored data is then printed.
 - This process repeats until the printer is turned off.
5. Turn the printer off, then press and hold **MENU** while turning the printer back on.
This ends the test and places you in the Menu mode.
6. Go to the **Serial I/F** group and change **Diagnostic Test** back to **No**.
7. Press **STORE** to save the setting, then press **MENU** to exit the Menu mode.

Ethernet® 10/100 BaseT Interface

The print server has an Ethernet 10/100 BaseT interface with an RJ45 receptacle and a parallel interface for interconnection with the printer.

The interface is supplied with a short cable for connection of the parallel interface.

Note: The Ethernet port requires a 10/100 BaseT cable with two twisted-wire pairs.

Ethernet 10/100 BaseT Interface Pin Assignments

Pin No.	Signal	Description
1	TD+	Transmit Data +
2	TD-	Transmit Data -
3	RD+	Receive Data +
4	Not Used	-
5	Not used	-
6	RD-	Receive Data
7, 8	Not Used	-

Print Server Parallel Output Pin Assignments

Pin No.	Signal	Source	Description
1	nSTROBE	Print Server	Indicates when the data on the data lines is valid.
2-9	DATA 1-8	Print Server	Eight lines used for data transfer.
10	nACK	Printer	Data acknowledge signal.
11	BUSY	Printer	Indicates the printer is not ready to receive data.
12	PAPER ERROR	Printer	Indicates a paper error.
13	SELECT	Printer	Indicates the printer is online.
14	nAUTOFEED	Print Server	Used for IEEE-1284 compliance.
15	nFAULT	Printer	Indicates a printer error condition.
16	nINIT	Print Server	Instructs the printer to initialize.
17	nSELECT IN	Print Server	Used for IEEE-1284 compliance.
18-25	GND	-	Ground

C: Command Summary

Epson FX Command Summary

Epson Command	ASCII	Hexadecimal	Decimal
Printer Operation/Data Control			
Configuration Group Select CFG1 P1 = 0: command valid P1 = 1: command invalid Select CFG2 P1 = 0: command valid P1 = 1: command invalid	ESC DLE J P1 SOH ESC DLE J P1 STX	1B 10 4A P1 01 1B 10 4A P1 02	27 16 74 P1 1 27 16 74 P1 2
Delete	DEL	7F	128
Emulation Mode, Select Epson FX IBM Proprinter OKI Microline Standard	ESC { @ ESC { NUL ESC { !	1B 7B 40 1B 7B 00 1B 7B 21	27 123 64 27 123 0 27 123 33
MSB Control Cancel MSB control Set MSB equal to 0 Set MSB equal to 1	ESC # ESC = ESC >	1B 23 1B 3D 1B 3E	27 35 27 61 27 62
Paper-Out Sensor Disable Enable	ESC 8 ESC 9	1B 38 1B 39	27 56 27 57

Epson Command	ASCII	Hexadecimal	Decimal
Printer Operation/Data Control (continued)			
Paper Path, Change to <i>Rear Path</i> P1 represents the number of bytes of data <i>Front Path</i> P1 represents the number of bytes of data	ESC DLE I P1 0 ESC DLE I P1 1	1B 10 49 P1 30 1B 10 49 P1 31	27 16 73 P1 48 27 16 73 P1 49
Print Direction Unidirectional Bidirectional Unidirectional for one line	ESC U 1 ESC U 0 ESC <	1B 55 31 1B 55 30 1B 3C	27 85 49 27 85 48 27 60
Print Speed, Half On Off	ESC s 1 ESC s 0	1B 73 31 1B 73 30	27 115 49 27 115 48
Print Suppress On Off	DC3 DC1	13 11	19 17
Reset Clear Print Buffer Clear Buffer and Initialize Printer	ESC @ CAN	1B 40 18	27 64 24
Select Menu Item See the end of this Appendix for details on this command.	ESC DLE D P _{no} P _{a1} P _{b1} P _{a2} P _{b2} ...P _{an} P _{bn}	1B 10 44 P _{no} P _{a1} P _{b1} P _{a2} P _{b2} ...P _{an} P _{bn}	27 16 68 P _{no} P _{a1} P _{b1} P _{a2} P _{b2} ...P _{an} P _{bn}
Software I-Prime	ESC }	1B 7D	27 125
Vertical Control			
Form Feed, Execute	FF	0C	12
Form Length Set in inches, n = 0 or 128 Set in lines, n = 1 to 127	ESC C NUL n ESC C n	1B 43 00 n 1B 43 n	27 67 0 n 27 67 n

Epson Command	ASCII	Hexadecimal	Decimal
Vertical Control (continued)			
Line Feed n/144 inch, n = 0 to 255 n/216 inch, n = 0 to 255 Forward LF with CR Reverse LF, n = 0 to 255	ESC % 5 n ESC J n LF ESC j n	1B 25 35 n 1B 4A n 0A 1B 6A n	27 37 53 n 27 74 n 10 27 106 n
Line Spacing n/72-inch increments n = 0 to 85, 128 to 213 n/144-inch increments n = 1 to 255 n/216-inch increments, n = 0 to 255 1/6-inch 1/8-inch 7/72-inch	ESC A n ESC % 9 n ESC 3 n ESC 2 ESC 0 ESC 1	1B 41 n 1B 25 39 n 1B 33 n 1B 32 1B 30 1B 31	27 65 n 27 37 57 n 27 51 n 27 50 27 48 27 49
Margins, Bottom (Auto Skip) Cancel Define, n = 0 to 127 lines	ESC O ESC N n	1B 4F 1B 4E n	27 79 27 78 n
Vertical Tabs Execute Define tab stops n = 1 to 255 k = 1 to 16 Define tab stops in channels m = 0 to 255 n = 0 to 7 Select channel n = 0 to 7, 128 to 135	VT ESC B n ₁ n ₂ ...n _k NUL ESC b n m ₁ m ₂ ...m _k NUL ESC / n	0B 1B 42 n ₁ n ₂ ...n _k 00 1B 62 n m ₁ m ₂ ...m _k 00 1B 2F n	11 27 66 n ₁ n ₂ ...n _k 0 27 98 n m ₁ m ₂ ...m _k 0 27 47 n

Epson Command	ASCII	Hexadecimal	Decimal
Horizontal Control (continued)			
Print Position Define position by dot columns, indexed from present position. Dot position = $n_1 + (n_2 \times 256)$ $n_1 = 0 \text{ to } 255$ $n_2 = 0 \text{ to } 255$ Execute print position from current left margin Dot position = $[n_1 + (n_2 \times 256)]/60$ $n_1 = 0 \text{ to } 255$ $n_2 = 0 \text{ to } 255$ Set print position $n = 0 \text{ to } 255$: # of bytes to follow $A_1 = 0 \text{ to } 255$: even, print position absolute from left edge; odd, print position relative to current position $A_2 = 0 \text{ to } 255$: even, toward right margin (forward); odd, toward left margin (reverse) $P_1 P_2 P_3 P_4 = 0000 \text{ to } 9999 \text{ ASCII}$	ESC \ $n_1 n_2$ ESC \$ $n_1 n_2$ ESC DLE @ $n A_1 A_2 P_1 P_2 P_3 P_4$	1B 5C $n_1 n_2$ 1B 24 $n_1 n_2$ 1B 10 40 $n A_1 A_2 P_1 P_2 P_3 P_4$	27 92 $n_1 n_2$ 27 36 $n_1 n_2$ 27 16 64 $n A_1 A_2 P_1 P_2 P_3 P_4$
Print Style/Print Size Control			
Character Pitch Select 10 cpi Select 12 cpi Condensed (17, 20 cpi) Select Cancel Select 15 CPI	ESC P ESC M ESC SI or SI DC2 ESC g	1B 50 1B 4D 1B 0F or 0F 12 1B 67	27 80 27 77 27 15 or 15 18 27 103

Epson Command	ASCII	Hexadecimal	Decimal
Print Style / Print Size Control (continued)			
Composite Command, Select Print Features and Pitch n = 0 to 255 <i>Bit</i> <i>1</i> <i>0</i> b ₇ : Underline Set Reset b ₆ : Italics Set Reset b ₅ : Dbl. Width Set Reset b ₄ : Enhanced Set Reset b ₃ : Emphasized Set Reset b ₂ : Compressed Set Reset b ₁ : Proportional Set Reset b ₀ : Set cpi 12 cpi 10 cpi	ESC ! n	1B 21 n	27 33 n
Double Height Printing On Off	ESC w 1 ESC w 0	1B 77 31 1B 77 30	27 119 49 27 119 48
Double Width (Expanded) Printing On Off One line only On Off	ESC W 1 ESC W 0 ESC SO, SO DC4	1B 57 31 1B 57 30 1B 0E, 0E 14	27 87 49 27 87 48 27 14, 14 20
Print Quality HSD NLQ Utility	ESC (0 ESC x 1 ESC x 0	1B 28 30 1B 78 31 1B 78 30	27 40 48 27 120 49 27 120 48
Proportional Width On Off	ESC p 1 ESC p 0	1B 70 31 1B 70 30	27 112 49 27 112 48

Epson Command	ASCII	Hexadecimal	Decimal
Print Style / Print Size Control (continued)			
Select font by pitch/point (for Option ROM) $P_n = 0$: fixed spacing $P_n = 1$: proportional spacing $L_p, H_p = 00H$ to FFH $N_p = L_p + (H_p \times 256)$ $N_p > 43$ Point Size = $N_p / 2$	ESC X $P_n L_p H_p$	1B 10 46 $P_n L_p H_p$	27 16 70 $P_n L_p H_p$
Typestyles Courier Gothic OCR-B	ESC k 0 ESC k 1 ESC k 5	1B 6B 30 1B 6B 31 1B 6B 35	27 107 48 27 107 49 27 107 53
Character Control			
Emphasized Mode Reset Set	ESC F ESC E	1B 46 1B 45	27 70 27 69
Enhanced (Double Strike) Reset Set	ESC H ESC G	1B 48 1B 47	27 72 27 71
Inter-Character Clearance, Set by dot columns $n = 0$ to 255	ESC SP n	1B 20 n	27 32 n
Justification Left Center Right Full	ESC a 0 ESC a 1 ESC a 2 ESC a 3	1B 61 30 1B 61 31 1B 61 32 1B 61 33	27 97 48 27 97 49 27 97 50 27 97 51

Epson Command	ASCII	Hexadecimal	Decimal
Character Control (continued)			
Superscript/Subscript			
Cancel	ESC T	1B 54	27 84
Subscript	ESC S 1	1B 53 31	27 83 49
Superscript	ESC S 0	1B 53 30	27 83 48
Underline			
On	ESC - 1	1B 2D 31	27 45 49
Off	ESC - 0	1B 2D 30	27 45 48
Character Set			
Assign character table L _n , H _n = 0 to 255 P _{n1} , P _{n2} , P _{n3} = 0 to 255	ESC (t H _n P _{n1} P _{n2} P _{n3}	1B 28 74 H _n P _{n1} P _{n2} P _{n3}	27 40 116 H _n P _{n1} P _{n2} P _{n3}
Control Codes, Printable			
Reset	ESC 7	1B 37	27 55
Set	ESC 6	1B 36	27 54
Control Codes/Printable Characters — on/off			
Interprets codes as printable characters	ESC | 1	1B 49 31	27 73 49
Interprets codes as control codes	ESC | 0	1B 49 30	27 73 48

Epson Command	ASCII	Hexadecimal	Decimal
Character Set (continued)			
International Language Character Sets			
American	ESC R NUL	1B 52 00	27 82 0
French	ESC R SOH	1B 52 01	27 82 1
German	ESC R STX	1B 52 02	27 82 2
British	ESC R ETX	1B 52 03	27 82 3
Danish I	ESC R EOT	1B 52 04	27 82 4
Swedish	ESC R ENQ	1B 52 05	27 82 5
Italian	ESC R ACK	1B 52 06	27 82 6
Spanish I	ESC R BEL	1B 52 07	27 82 7
Japanese	ESC R BS	1B 52 08	27 82 8
Norwegian	ESC R HT	1B 52 09	27 82 9
Danish II	ESC R LF	1B 52 0A	27 82 10
Spanish II	ESC R VT	1B 52 0B	27 82 11
Latin American	ESC R FF	1B 52 0C	27 82 12
French Canadian	ESC R CR	1B 52 0D	27 82 13
Dutch	ESC R SO	1B 52 0E	27 82 14
Publisher	ESC R @	1B 52 40	27 82 64
Code Page			
Multilingual 850	ESC R SUB	1B 52 1A	27 82 26
Norway 865	ESC R ESC	1B 52 1B	27 82 27
Portugal 860	ESC R FS	1B 52 1C	27 82 28
Canada French	ESC R +	1B 52 2B	27 82 43
BRASCII	ESC R P	1B 52 50	27 82 80
Abicomp	ESC R Q	1B 52 51	27 82 81
ISO 8859/15	ESC R R	1B 52 52	27 82 82
IBM Multilingual 858	ECS R S	1B 52 53	27 82 83
Italic Character Set			
Cancel	ESC 5	1B 35	27 53
Select	ESC 4	1B 34	27 52
Slant (Italics)/Graphics Character Table			
Slant (italic)	ESC t 0	1B 74 30	27 116 48
Epson Graphics	ESC t 1	1B 74 31	27 116 49

Epson Command	ASCII	Hexadecimal	Decimal
DLL Character Set			
Copy Pre-defined ROM data to RAM			
NLQ Courier	ESC : NUL NUL NUL	1B 3A 00 00 00	27 58 0 0 0
NLQ Gothic	ESC : NUL SOH NUL	1B 3A 00 01 00	27 58 0 1 0
NLQ OCR-B	ESC : NUL ENQ NUL	1B 3A 00 05 00	27 58 0 5 0
Select DLL Font			
DLL character set	ESC % 1	1B 25 31	27 37 49
Pre-defined character set	ESC % 0	1B 25 30	27 37 48
Graphics Control			
Bit Image Graphics			
Double Horizontal Density, normal speed n1, n2 = 0 to 255, specifies # of columns	ESC L n ₁ n ₂ <graphics data>	1B 4C n ₁ n ₂ <graphics data>	27 89 n ₁ n ₂ <graphics data>
Double Horizontal Density, high speed n ₁ , n ₂ = 0 to 255, specifies # of columns	ESC Y n ₁ n ₂ <graphics data>	1B 59 n ₁ n ₂ <graphics data>	27 89 n ₁ n ₂ <graphics data>
Quadruple Horizontal Density n1, n2 = 0 to 255, specifies # of columns	ESC Z n ₁ n ₂ <graphics data>	1B 5A n ₁ n ₂ <graphics data>	27 90 n ₁ n ₂ <graphics data>

Epson Command	ASCII	Hexadecimal	Decimal
Graphics Control (continued)			
Reassign as Quadruple Density n = 0 , 60 dpi n = 1, 120 dpi n = 2, 120 dpi/ Quasi density n = 3, 240 dpi/ Quasi density n = 4, 80 dpi n = 5, 72 dpi n = 6, 90 dpi n = 7, 144 dpi	ESC ? Z n	1B 3F 5A n	27 63 90 n
Select 9 pin mode m = 0: single density graphics m = 1: double density graphics m = 2: high-speed dbl. density graphics m = 3: quadruple density graphics n ₁ , n ₂ = 0 to 255: total number of dot columns to be printed in graphics n = total number of dots to be printed: n ₁ = n - (n ₂ x 256) n ₂ = INT (n/256)	ESC ^ m n1 n2	1B 5E m n1 n2	27 94 m n1 n2

Epson Command	ASCII	Hexadecimal	Decimal
Graphics Control (continued)			
Select density and enter graphics mode m = 0 : single density, 60 dpi m = 1: slow speed double density, 120 dpi m = 2: high speed double density, 120 dpi m = 3: quadruple density, 240 dpi m = 4: CRTI, 80 dpi m = 5: Plotter (1 : 1), 72 dpi m = 6: CRTII, 90 dpi m = 7: Double density plotter, 144 dpi n ₁ , n ₂ = 0 to 255, specifies # of columns	ESC * m n ₁ n ₂ <graphics data>	1B 2A m n ₁ n ₂ <graphics data>	27 42 m n ₁ n ₂ <graphics data>
Single Horizontal Density n ₁ , n ₂ = 0 to 255, specifies # of columns	ESC K n ₁ n ₂ <graphics data>	1B 4B n ₁ n ₂ <graphics data>	27 75 n ₁ n ₂ <graphics data>
Bar Code Commands (see the end of this Appendix)			

IBM Proprinter III Command Summary

IBM Command	ASCII	Hexadecimal	Decimal
Printer Operation / Data Control			
Configuration Group, Select Select CFG1 $P_1 = 0$: command valid $P_1 = 1$: command invalid Select CFG2 $P_1 = 0$: command valid $P_1 = 1$: command invalid IBM Character Set III (All Character Set) Select n_1, n_2 = total number of characters to be printed; total = $n_1 + (n_2 \times 256)$ Print one character only	ESC DLE J P_1 SOH ESC DLE J P_1 STX ESC \ $n_1 n_2$ ESC ^	1B 10 4A P_1 01 1B 10 4A P_1 02 1B 5C $n_1 n_2$ 1B 5E	27 16 74 P_1 1 27 16 74 P_1 2 27 92 $n_1 n_2$ 27 94
Emulation Mode, Select IBM Proprinter Epson FX OKI Microline Standard	ESC { NUL ESC { @ ESC { !	1B 7B 00 1B 7B 40 1B 7B 21	27 123 0 27 123 64 27 123 33
Paper-Out Sensor Disable Enable	ESC 8 ESC 9	1B 38 1B 39	27 56 27 57
Paper Path, Change to: Rear Path P_1 represents the number of bytes of data Front Path P_1 represents the number of bytes of data	ESC DLE I P_1 0 ESC DLE I P_1 1	1B 10 49 P_1 30 1B 10 49 P_1 31	27 16 73 P_1 48 27 16 73 P_1 49

IBM Command	ASCII	Hexadecimal	Decimal
Printer Operation/Data Control (continued)			
Print Direction Unidirectional Bidirectional	ESC U 1 ESC U 0	1B 55 31 1B 55 30	27 85 49 27 85 48
Print Stop	ESC j	1B 6A	27 106
Print Suppress On Off	ESC Q n DC1	1B 51 n 11	27 81 n 17
Reset — Clear Print Buffer	CAN	18	24
Select Menu Item 1 See the end of this Appendix for details on this command.	ESC DLE D Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	1B 10 44 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	27 16 68 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n
Select Menu Item 2 See the end of this Appendix for details on this command.	ESC DLE E Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	1B 10 45 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	27 16 69 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n
Software I-Prime	ESC } NUL	1B 7D 00	27 125 0
Vertical Control			
Form Feed	FF	0C	12
Form Length Define amount by inches n = 1 to 255 Define amount by lines n = 1 to 255	ESC C NUL n ESC C n	1B 43 00 n 1B 43 n	27 67 0 n 27 67 n

IBM Command	ASCII	Hexadecimal	Decimal
Vertical Control (continued)			
Line Feed			
Automatic LF			
On	ESC 5 1	1B 35 31	27 53 49
Off	ESC 5 0	1B 35 30	27 53 48
In n/144-inch increments n = 0 to 255	ESC % 5 n	1B 25 35 n	27 37 53 n
In n/216-inch increments n = 1 to 255	ESC J n	1B 4A n	27 74 n
Execute Line Feed with Carriage Return	LF	0A	10
Single Reverse Line Feed	ESC]	1B 5D	27 93
Line Spacing			
In n/72-inch increments, n = 0 to 255	ESC A n	1B 41 n	27 65 n
Activate line spacing defined by ESC A n	ESC 2	1B 32	27 50
In n/144-inch, n = 0 to 255	ESC % 9 n ₁	1B 25 39 n ₁	27 37 57 n ₁
In n/216-inch, n = 1 to 255	ESC 3 n	1B 33	7 51
1/8-inch	ESC 0	1B 30	27 48
1/6-inch	ESC 1	1B 31	27 49
Margins, Bottom (Auto Skip)			
Cancel	ESC O	1B 4	27 79
Define, n = 0 to 255 lines	ESC N n	1B 4E	27 78
Top of Form, Define	ESC 4	1B 34	27 52
Vertical Tab			
Execute	VT	0B	11
Set all tabs to power-on default values	ESC R	1B 52	27 82
Define tab stops (up to 64) k = 1 to 64 n = 1 to 255	ESC B n ₁ n ₂ ...n _k NUL	1B 42 n ₁ n ₂ ...n _k 00	27 66 n ₁ n ₂ ...n _k 0

IBM Command	ASCII	Hexadecimal	Decimal
Horizontal Control			
Backspace	BS	08	8
Carriage Return, Execute	CR	0D	13
Margins, Define Left & Right n ₁ = 1 to 255: left margin n ₂ = 2 to 255: right margin n ₁ < n ₂	ESC X n ₁ n ₂	1B 58 n ₁ n ₂	27 88 n ₁ n ₂
Print Position, Define By dot, n ₁ n ₂ = 0 to 255 dots Set by dot columns, absolute to the home position n ₁ n ₂ n ₃ n ₄ = 0000 to 9999 ASCII 0000 ≤ n ₁ n ₂ n ₃ n ₄ ≤ Right Margin Right Margin in Units of Dots Columns: <i>Pitch</i> <i>Dots</i> 10 cpi 1633 12 cpi 1959 15 cpi 2449 17.1 cpi 2798 20 cpi 3264	ESC | n ₁ n ₂ ESC % B n ₁ n ₂ n ₃ n ₄	1B 7C n ₁ n ₂ 1B 25 42 n ₁ n ₂ n ₃ n ₄	27 124n ₁ n ₂ 27 37 66 n ₁ n ₂ n ₃ n ₄

IBM Command	ASCII	Hexadecimal	Decimal
Horizontal Control (continued)			
Set print position n = 0 to 255: # of bytes to follow A1 = 0 to 255: even, print position absolute from left edge; odd, print position relative to current position A2 = 0 to 255: even, toward right margin (forward); odd, toward left margin (reverse) P ₁ P ₂ P ₃ P ₄ = 0000 to 9999 ASCII	ESC DLE @ n A ₁ A ₂ P ₁ P ₂ P ₃ P ₄	1B 10 40 n A ₁ A ₂ P ₁ P ₂ P ₃ P ₄	27 16 64 n A ₁ A ₂ P ₁ P ₂ P ₃ P ₄
Horizontal Tab, Execute	HT	09	9
Horizontal Tabs, Define stops by characters k = 1 to 28 tab stops x = 1 to 255 <i>Pitch Dots</i> 10 cpi 136 12 cpi 164 15 cpi 204 17.1 cpi 234 20 cpi 255	ESC D x ₁ x ₂ x ₃ ...x _k NUL	1B 44 x ₁ x ₂ x ₃ ...x _k 00	27 68 x ₁ x ₂ x ₃ ...x _k 0
Print Style / Print Size Control			
Proportional Printing On Off	ESC P 1 ESC P 0	1B 50 31 1B 50 30	27 80 49 27 80 48

IBM Command	ASCII	Hexadecimal	Decimal
Print Style / Print Size Control (continued)			
Character Pitch 10 cpi 12 cpi 15 cpi 17.1 cpi 20 cpi	DC2 ESC : ESC g SI ESC SI	12 1B 3A 1B 67 0F 1B 0F	18 27 58 27 103 15 27 15
Double Height and Width, Select $n_1 = 0$ to 255: normally 4 $n_2 = 0$ to 255: normally 0 $m_1, m_2 = 0$ $m_3 = 0$ to 255 m_3^* Function 0 No change. 1 LF unchanged, single height 2 LF unchanged, double height 16 Single LF, height unchanged 17 Single LF, single height 18 Single LF, double height 32 Double LF, height unchanged 33 Double LF, single height 34 Double LF, double height * decimal $m_4 = 0$ to 255 m_4^* Function 1 Single width 2 Double width * decimal	ESC [@ $n_1 n_2 m_1 m_2 m_3 m_4$	1B 5B 40 $n_1 n_2 m_1 m_2 m_3 m_4$	27 91 64 $n_1 n_2 m_1 m_2 m_3 m_4$

IBM Command	ASCII	Hexadecimal	Decimal
Print Style / Print Size Control (continued)			
Double Width On Off For one line only On Off	ESC W 1 ESC W 0 SO DC4	1B 57 31 1B 57 30 0E 14	27 87 49 27 87 48 14 20
Print Quality Select Font, n = 0 to 255 <i>MSB value</i> <i>of n LSB</i> <i>Print Mode</i> XXXX0000B ROM UTL XXXX0001B HSD 12 cpi XXXX0010B ROM NLQ (Sans Serif) XXXX0011B ROM NLQ II Courier XXXX0100B DLL UTL XXXX0101B DLL UTL 12 cpi XXXX0110B DLL NLQ XXXX0111B DLL NLQ II XXXX1011B ROM NLQ II Courier XXXX1111B Alternate DLL NLQ II	ESC I n	1B 49 n	27 73 n
Select HSD	ESC # 0	1B 23 30	27 35 48

IBM Command	ASCII	Hexadecimal	Decimal								
Print Style/Print Size Control (continued)											
Select Pitch and Point (for option ROM) Pno specifies the number of bytes of the succeeding parameter; normally = 3 P _n = 0: fixed spacing P _n = 1: proportional spacing L _p , H _p set point size (N _p): N _p = [L _p + (H _p x 256)] x 2 <table><tr><td>N_p</td><td>Point Size</td></tr><tr><td>0 to 43</td><td>Ignored</td></tr><tr><td>44 to 431</td><td>22 to 215</td></tr><tr><td>432</td><td>216</td></tr></table>	N _p	Point Size	0 to 43	Ignored	44 to 431	22 to 215	432	216	ESC DLE F Pno P _n L _p H _p	1B 10 46 Pno P _n L _p H _p	27 16 70 Pno P _n L _p H _p
N _p	Point Size										
0 to 43	Ignored										
44 to 431	22 to 215										
432	216										
Character Control											
Emphasized On Off	ESC E ESC F	1B 45 1B 46	27 69 27 70								
Enhanced (double strike) On Off	ESC G ESC H	1B 47 1B 48	27 71 27 72								
Inter-Character Clearance, Set by dot columns n = 0 to 11	ESC V n	1B 56 n	27 86 n								
Overscore On Off	ESC _ 1 ESC _ 0	1B 5F 31 1B 5F 30	27 95 49 27 95 48								
Superscript/Subscript Cancel Subscript Superscript	ESC T ESC S 1 ESC S 0	1B 54 1B 53 31 1B 53 30	27 84 27 83 49 27 83 48								

IBM Command	ASCII	Hexadecimal	Decimal
Character Control (continued)			
Underline			
On	ESC - 1	1B 2D 31	27 45 49
Off	ESC - 0	1B 2D 30	27 45 48
Character Sets			
IBM Character Set I, Select	ESC 7	1B 37	27 55
IBM Character Set II, Select	ESC 6	1B 36	27 54
IBM Code Page, Select $L_n, H_n = 0$ to 255: specifies amount of data to follow; $data = L_n + (H_n \times 256)$ $NUL = 0$ to 255 $H_{cp}, L_{cp} = 0$ to 255: identifies Code Page number; $ID\ No. = (H_{cp} \times 256) + L_{cp}$ <i>ID Code Page</i> 437 USA 850 Multilingual 858 IBM Multilingual 858 860 Portugal 863 Canada French 865 Norway 1040 BRASCII 1041 Abicomp 1081 ISO 8859/15	ESC [T L_n H_n NUL NUL H_{cp} L_{cp} NUL	1B 5B 54 L_n H_n 00 00 H_{cp} L_{cp} 00	27 91 84 L_n H_n 0 0 H_{cp} L_{cp} 0

IBM Command	ASCII	Hexadecimal	Decimal
Character Sets (continued)			
International Language Character Set, Select			
American Slashed Zero	ESC ! @	1B 21 40	27 33 64
American Unslashed Zero	ESC ! A	1B 21 41	27 33 65
British	ESC ! B	1B 21 42	27 33 66
German	ESC ! C	1B 21 43	27 33 67
French	ESC ! D	1B 21 44	27 33 68
Swedish	ESC ! E	1B 21 45	27 33 69
Danish	ESC ! F	1B 21 46	27 33 70
Norwegian	ESC ! G	1B 21 47	27 33 71
Dutch	ESC ! H	1B 21 48	27 33 72
Italian	ESC ! I	1B 21 49	27 33 73
French Canadian	ESC ! J	1B 21 4A	27 33 74
Spanish	ESC ! K	1B 21 4B	27 33 75
Latin American	ESC ! L	1B 21 4C	27 33 76
Publisher	ESC ! Z	1B 21 5A	27 33 90
Slant			
Off	ESC % H	1B 25 48	27 37 72
On	ESC % G	1B 25 47	27 37 71
DLL Character Set			
Custom Font Command See the end of this Appendix for details on this command.	ESC = c ₁ c ₂ m n a ₁ a ₂ d ₁ ...d ₁₁ a ₁ a ₂ d ₁ ...	1B 3D c ₁ c ₂ m n a ₁ a ₂ d ₁ ...d ₁₁ a ₁ a ₂ d ₁ ...	27 61 c ₁ c ₂ m n a ₁ a ₂ d ₁ ...d ₁₁ a ₁ a ₂ d ₁ ...
Copy ROM Data to RAM	ESC \$	1B 24	27 36

IBM Command	ASCII	Hexadecimal	Decimal
Graphics Control			
Bit Image Graphics			
Single Horizontal Density $n_1, n_2 = 0$ to 255, specifies # of columns	ESC K $n_1 n_2$ <graphics data>	1B 4B $n_1 n_2$ <graphics data>	27 75 $n_1 n_2$ <graphics data>
Double Horizontal Density, normal speed $n_1, n_2 =$ $n1, n2 = 0$ to 255, specifies # of columns	ESC L $n_1 n_2$ <graphics data>	1B 4C $n_1 n_2$ <graphics data>	27 76 $n_1 n_2$ <graphics data>
Double Horizontal Density, high speed $n_1, n_2 = 0$ to 255, specifies # of columns	ESC Y $n_1 n_2$ <graphics data>	1B 59 $n_1 n_2$ <graphics data>	27 89 $n_1 n_2$ <graphics data>
Quadruple Horizontal Density $n_1, n_2 = 0$ to 255, specifies # of columns	ESC Z $n_1 n_2$ <graphics data>	1B 5A $n_1 n_2$ <graphics data>	27 90 $n_1 n_2$ <graphics data>
Bar Code (see the end of this Appendix)			

Okidata Microline Standard Command Summary

Okidata Command	ASCII	Hexadecimal	Decimal
Printer Operation/Data Control			
Configuration Group, Select			
Select CFG1 $P_1 = 0$: command valid $P_1 = 1$: command invalid	ESC DLE J P_1 SOH	1B 10 4A P_1 01	27 16 74 P_1 1
Select CFG2 $P_1 = 0$: command valid $P_1 = 1$: command invalid	ESC DLE J P_1 STX	1B 10 4A P_1 02	27 16 74 P_1 2

Okidata Command	ASCII	Hexadecimal	Decimal
Printer Operation / Data Control (continued)			
Emulation Mode, Select OKI Microline Standard Epson FX IBM Proprinter	ESC { ! ESC { @ ESC { NUL	1B 7B 21 1B 7B 40 1B 7B 00	27 123 33 27 123 64 27 123 0
Paper-Out Sensor Override Enable Disable	ESC E 0 ESC E 1	1B 45 30 1B 45 31	27 69 48 27 69 49
Paper Path, Change to Rear Path P ₁ represents the number of bytes of data Front Path P ₁ represents the number of bytes of data	ESC DLE I P ₁ 0 ESC DLE I P ₁ 1	1B 10 49 P ₁ 30 1B 10 49 P ₁ 31	27 16 73 P ₁ 48 27 16 73 P ₁ 49
Print Direction Bi-directional Uni-directional	ESC = ESC -	1B 3D 1B 2D	27 61 27 45
Print Speed Full Half	ESC > ESC <	1B 3E 1B 3C	27 62 27 60
Print Suppress Off On	DC1 DC3	11 13	17 19
Reset Clear Print Buffer Print Data and Initialize Printer	CAN ESC CAN	18 1B 18	24 27 24

Oki Data Command	ASCII	Hexadecimal	Decimal
Printer Operation/Data Control (continued)			
Select Menu Item See the end of this Appendix for details on this command.	ESC DLE D Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	1B 10 44 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	27 16 68 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n
Shift - In Out	SI SO	0F 0E	15 14
Software I-PRIME	ESC } NUL	1B 7D 00	27 125 0
Vertical Control			
Carriage Return and Line Feed Control	ESC ? n :	1B 3F n 3A	27 63 n 58
Line Feed, n/144 inch n = 0 to 255	ESC % 5 n	1B 25 35 n	27 37 53 n
Form Feed - Execute	FF	0C	12
Form Length n ₁ n ₂ = 00 (defaults to menu setting) to 99 <i>Range: n_p n₂</i> ASCII 0 to 9 Decimal 48 to 57 Hex. 30 to 39 By 1/2 inch: amount = n ₁ n ₂ x 1/2-inch By Lines maximum form length is dependent on current line feed spacing	ESC G n ₁ n ₂ ESC F n ₁ n ₂	1B 47 n ₁ n ₂ 1B 46 n ₁ n ₂	27 71 n ₁ n ₂ 27 70 n ₁ n ₂

Oki Data Command	ASCII	Hexadecimal	Decimal
Vertical Control (continued)			
Line Feed Execute Direct Skip n ₁ , n ₂ = 48 to 57 Forward LF with CR Reverse Without Carriage Return	ESC VT n ₁ n ₂ LF ESC LF ESC DC2	1B 0B n ₁ n ₂ 0A 1B 0A 1B 12	27 11 n ₁ n ₂ 10 27 10 27 18
Line Spacing n/144-inch increments n = 0 to 127 1/6-inch increments 1/8-inch increments Margin, Bottom (Auto Skip) n = 48 to 57	ESC % 9 n ESC 6 ESC 8 ESC % S n	1B 25 39 n 1B 36 1B 38 1B 25 53 n	27 37 57 n 27 54 27 56 27 37 83 n
Top of Form, Define	ESC 5	1B 35	27 53
Vertical Tab Define Tab Stops in channels (VFU) n ₁ = 49 to 60 s ₁ ...sx = 1 to 127 Move to tab stop n: ASCII Dec. Hex. 1 49 31 2 50 32 3 51 33 4 52 34 5 53 35 6 54 36 7 55 37 8 56 38 9 57 39 : 58 3A ; 59 3B < 60 3C	DC4 s ₁ ...s _x n ₁ ? VT n	14 s ₁ ...s _x n ₁ 3F 0B n	20 s ₁ ...s _x n ₁ 63 11 n

Oki Data Command	ASCII	Hexadecimal	Decimal
Horizontal Control			
Backspace	BS	08	8
Carriage Return, Execute	CR	0D	13
Horizontal Tabs Execute Define up to 16 stops by character columns $XYZ = 000$ to 999 ASCII $X_1 Y_1 Z_1 < X_2 Y_2 Z_2$ $< X_m Y_m Z_m$ <i>Pitch</i> <i>Argument</i> " $X_1 Y_1 Z_1$ " 10 cpi 136 12 cpi 163 15 cpi 204 17.1 cpi 233 20 cpi 272 Define up to 16 stops by dot columns $XYZW = 0000$ to 9999 $X_1 Y_1 Z_1 W_1 < X_2 Y_2 Z_2 W_2$ $< X_m Y_m Z_m W_m$ <i>Pitch</i> <i>Argument</i> " $X_1 Y_1 Z_1 W_1$ " 10 cpi 1,632 12 cpi 1,956 15 cpi 2,448 17.1 cpi 2,796 20 cpi 3,264	HT ESC HT $X_1 Y_1 Z_1$, ..., $X_m Y_m Z_m$ CR	09 1B 09 $X_1 Y_1 Z_1$, ..., $X_m Y_m Z_m$ 0D	9 27 9 $X_1 Y_1 Z_1$, ..., $X_m Y_m Z_m$ 13
	ESC ETX $X_1 Y_1 Z_1$ W_1 , ..., $X_m Y_m Z_m$ W_m CR	1B 03 $X_1 Y_1 Z_1$ W_1 , ..., $X_m Y_m Z_m$ W_m 0D	27 3 $X_1 Y_1 Z_1$ W_1 , ..., $X_m Y_m Z_m$ W_m 13

Oki Data Command	ASCII	Hexadecimal	Decimal
Horizontal Control (continued)			
Margins Left Margin, in 1/120-inch increments n ₁ n ₂ n ₃ = 000 to 999 ASCII n ₁ n ₂ n ₃ = 0000: command ignored n ₁ n ₂ n ₃ = 0001: left margin cleared Right Margin, in 1/120-inch increments n ₁ n ₂ n ₃ n ₄ = 0000 to 9999 ASCII w/o left margin: 300 < RM ≤ 1632 with left margin: LM + 300 ≤ RM ≤ 1632	 ESC % C n ₁ n ₂ n ₃ ESC % R n ₁ n ₂ n ₃ n ₄	 1B 25 43 n ₁ n ₂ n ₃ 1B 25 52 n ₁ n ₂ n ₃ n ₄	 27 37 67 n ₁ n ₂ n ₃ 27 37 82 n ₁ n ₂ n ₃ n ₄
Print Position Set by dot columns, absolute to the home position n ₁ n ₂ n ₃ n ₄ = 0000 to 9999 ASCII 0000 ≤ n ₁ n ₂ n ₃ n ₄ ≤ Right Margin Right Margin in Units of Dots Columns: <i>Pitch</i> <i>Dots</i> 10 cpi 1633 12 cpi 1959 15 cpi 2449 17.1 cpi 2798 20 cpi 3264	 ESC % B n ₁ n ₂ n ₃ n ₄	 1B 25 42 n ₁ n ₂ n ₃ n ₄	 27 37 66 n ₁ n ₂ n ₃ n ₄

Oki Data Command	ASCII	Hexadecimal	Decimal
Horizontal Control (continued)			
Print Position (continued) Set by dot columns, left from current position $n_1 n_2 n_3 n_4 = 0000$ to 9999 ASCII $n_1 n_2 n_3 n_4 = 0000$: command ignored Set by dot columns, right from current position $n_1 n_2 n_3 n_4 = 0000$ to 9999 ASCII $n_1 n_2 n_3 n_4 = 0000$: command ignored Set print position $n = 0$ to 255 : # of bytes to follow $A_1 = 0$ to 255 : even, print position absolute from left edge; odd, print position relative to current position $A_2 = 0$ to 255 : even, toward right margin (forward); odd, toward left margin (reverse) $P_1 P_2 P_3 P_4 = 0000$ to 9999 ASCII	ESC % F $n_1 n_2 n_3 n_4$ ESC % E $n_1 n_2 n_3 n_4$ ESC DLE @ n $A_1 A_2 P_1 P_2 P_3 P_4$	1B 25 46 $n_1 n_2 n_3 n_4$ 1B 25 45 $n_1 n_2 n_3 n_4$ 1B 10 40 n $A_1 A_2 P_1 P_2 P_3 P_4$	27 37 70 $n_1 n_2 n_3 n_4$ 27 37 69 $n_1 n_2 n_3 n_4$ 27 16 64 n $A_1 A_2 P_1 P_2 P_3 P_4$
Print Style / Print Size Control			
Character Pitch 10 cpi 12 cpi 17.1 cpi 20 cpi 15 cpi	RS FS GS ESC # 3 ESC g	1E 1C 1D 1B 23 33 1B 67	30 28 29 27 35 51 27 103

Oki Data Command	ASCII	Hexadecimal	Decimal
Print Style / Print Size Control (continued)			
Custom Fonts Select the NLQ custom character font (DLL) which is synthesized from the UTL custom character data Select UTL DLL Font	ESC 7 ESC 2	1B 37 1B 32	27 55 27 50
Double Height Printing On Off	ESC US 1 ESC US 0	1B 1F 31 1B 1F 30	27 31 49 27 31 48
Double Width Printing	US	1F	31
Print Quality HSD NLQ Courier NLQ Sans Serif Utility	ESC # 0 ESC 1 ESC 3 ESC 0	1B 23 30 1B 31 1B 33 1B 30	27 35 48 27 49 27 51 27 48
Proportional Spacing On Off	ESC Y ESC Z	1B 59 1B 5A	27 89 27 90
Select Pitch and Point (for option ROM) Pno specifies the number of bytes of the succeeding parameter; normally = 3 P _n = 0: fixed spacing P _n = 1: proportional spacing L _p , H _p set point size (N _p): N _p = [L _p + (H _p x 256)] x 2 N _p Point Size 0 o 43 Ignored 44 to 431 22 to 215 432 216	ESC DLE F Pno P _n L _p H _p	1B 10 46 Pno P _n L _p H _p	27 16 70 Pno P _n L _p H _p

Oki Data Command	ASCII	Hexadecimal	Decimal																																												
Print Style / Print Size Control (continued)																																															
Select Print Modes and Features	ESC & n ₁ n ₂ n ₃ n ₄ :	1B 26 n ₁ n ₂ n ₃ n ₄ 3A	27 38 n ₁ n ₂ n ₃ n ₄ 58																																												
<table><tr><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>n₁</td><td>x</td><td>0</td><td>1</td><td>Dbl Width</td><td>20 cpi</td><td>17.1 cpi</td><td>12 cpi</td><td>10 cpi</td></tr><tr><td>n₂</td><td>x</td><td>1</td><td>0</td><td>Enhanced</td><td>Emphasized</td><td>Superscript</td><td>Subscript</td><td>Normal size</td></tr><tr><td>n₃</td><td>x</td><td>1</td><td>1</td><td>0</td><td>Slant</td><td>DLL mode</td><td>NLQ</td><td>Normal</td></tr><tr><td>n₄</td><td>x</td><td>1</td><td>1</td><td>1</td><td>Dbl Height</td><td>Underline</td><td>x</td><td>HSD</td></tr></table>				b7	b6	b5	b4	b3	b2	b1	b0	n ₁	x	0	1	Dbl Width	20 cpi	17.1 cpi	12 cpi	10 cpi	n ₂	x	1	0	Enhanced	Emphasized	Superscript	Subscript	Normal size	n ₃	x	1	1	0	Slant	DLL mode	NLQ	Normal	n ₄	x	1	1	1	Dbl Height	Underline	x	HSD
b7	b6	b5	b4	b3	b2	b1	b0																																								
n ₁	x	0	1	Dbl Width	20 cpi	17.1 cpi	12 cpi	10 cpi																																							
n ₂	x	1	0	Enhanced	Emphasized	Superscript	Subscript	Normal size																																							
n ₃	x	1	1	0	Slant	DLL mode	NLQ	Normal																																							
n ₄	x	1	1	1	Dbl Height	Underline	x	HSD																																							
Character Control																																															
Emphasized/Enhanced Emphasized On Enhanced On Emphasized/Enhanced Off	ESC T ESC H ESC I	1B 54 1B 48 1B 49	27 84 27 72 27 73																																												
Define the number of blank dot columns (n) to be added on to the end of the normal character cell matrix. n = 0 to 11	ESC N n	1B 4E n	27 78 n																																												
Subscript Off On	ESC M ESC L	1B 4D 1B 4C	27 77 27 76																																												
Superscript On Off	ESC J ESC K	1B 4A 1B 4B	27 74 27 75																																												
Underline On Off	ESC C ESC D	1B 43 1B 44	27 67 27 68																																												

Oki Data Command	ASCII	Hexadecimal	Decimal
Character Sets			
IBM Code Page, Select $L_n, H_n = 0 \text{ to } 255$: specifies amount of data to follow; $\text{data} = L_n + (H_n \times 256)$ $\text{NUL} = 0 \text{ to } 255$ $H_{cp}, L_{cp} = 0 \text{ to } 255$: identifies Code Page number; ID No. = $(H_{cp} \times 256) + L_{cp}$ ID Code Page 437 USA 850 Multilingual 858 IBM Multilingual 858 860 Portuguese 863 Canada French 865 Norway 1040 BRASCII 1041 Abicom 1081 ISO 8859/15	ESC [T L_n H_n NUL NUL H_{cp} L_{cp} NUL	1B 5B 54 L_n H_n 00 00 H_{cp} L_{cp} 00	27 91 84 L_n H_n 0 0 H_{cp} L_{cp} 0
International Language Character Set, Select American Slashed Zero American Unslashed Zero British German French Swedish Danish Norwegian Dutch Italian French Canadian Spanish Latin American Publisher	ESC ! @ ESC ! A ESC ! B ESC ! C ESC ! D ESC ! E ESC ! F ESC ! G ESC ! H ESC ! I ESC ! J ESC ! K ESC ! L ESC ! Z	1B 21 40 1B 21 41 1B 21 42 1B 21 43 1B 21 44 1B 21 45 1B 21 46 1B 21 47 1B 21 48 1B 21 49 1B 21 4A 1B 21 4B 1B 21 4C 1B 21 5A	27 33 64 27 33 65 27 33 66 27 33 67 27 33 68 27 33 69 27 33 70 27 33 71 27 33 72 27 33 73 27 33 74 27 33 75 27 33 76 27 33 90

Oki Data Command	ASCII	Hexadecimal	Decimal
Character Sets (continued)			
Slant			
On	ESC ! /	1B 21 2F	27 33 47
Off	ESC ! *	1B 21 2A	27 33 42
Symbol Sets			
Okidata Standard Symbol Set	ESC ! 0	1B 21 30	27 33 48
Okidata Block Graphics Symbol Set	ESC ! 1	1B 21 31	27 33 49
IBM Symbol Set	ESC ! 2	1B 21 32	27 33 50
DLL Character Sets			
Custom Fonts			
Create Pattern and copy ROM to RAM	ESC \$	1B 24	27 36
Define up to 256 ascender characters using 11H x 7V matrix. m = 0 to 255 decimal: address of defined characters m = 0 to 2, 7 to 20 and 22 to 31: data ignored n ₁ ...n ₁₁ = 0 to 127: column data, each column of data = 1 byte	ESC % A m n ₁ ...n ₁₁	1B 25 41 n ₁ ...n ₁₁	27 37 65n ₁ ...n ₁₁

Oki Data Command	ASCII	Hexadecimal	Decimal																										
DLL Character Sets (continued)																													
Define up to 256 ascender characters using 11H x 7V matrix. m = 0 to 255 decimal: address of defined characters m = 0 to 2, 7 to 20 and 22 to 31: data ignored n1...n11 = 0 to 127: column data, each column of data = 1 byte	ESC % D n ₁ ...n ₁₁	1B 25 44 n ₁ ...n ₁₁	27 37 68 n ₁ ...n ₁₁																										
Graphics Control																													
Bit Image Graphics Engage Quasi Quadruple Horizontal Density True Double Horizontal Density True single density horizontal graphics Modes and Features	ETX ESC # Q ESC R ESC P or ESC Q ESC * n :	03 1B 23 51 1B 52 1B 50 or 1B 51 1B 2A n 3A	3 27 35 81 27 82 27 80 or 27 81 27 42 n 58																										
<table><tr><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>n₁</td><td>x</td><td>1</td><td>1</td><td>quad. density</td><td>double density</td><td>single density</td><td>72 dpi</td><td>60 dpi</td></tr><tr><td>n₂</td><td>x</td><td>1</td><td>0</td><td>8 bit</td><td>double speed*</td><td>x</td><td>x</td><td>x</td></tr></table>				b7	b6	b5	b4	b3	b2	b1	b0	n ₁	x	1	1	quad. density	double density	single density	72 dpi	60 dpi	n ₂	x	1	0	8 bit	double speed*	x	x	x
b7	b6	b5	b4	b3	b2	b1	b0																						
n ₁	x	1	1	quad. density	double density	single density	72 dpi	60 dpi																					
n ₂	x	1	0	8 bit	double speed*	x	x	x																					
* Applies only if double or quadruple density is selected.																													
Bar Code (see the end of this Appendix)																													

Bar Code Commands (Epson FX, IBM Proprinter III, Okidata Microline Standard)

Select Bar Code Type and Size Command

ASCII	Hexadecimal	Decimal
ESC DLE A $p_1 n_1 \dots n_8$ <data>	1B 10 41 $p_1 n_1 \dots n_8$ <data>	27 16 65 $p_1 n_1 \dots n_8$ <data>

Parameter p_1

p_1 specifies the subsequent data amount (MSB is ignored).

- $p_1 = 0, 1$, or 3 : command is ignored.
- $p_1 = 2, 4, 5, 6, 7$, or 8 : command is valid.
- $p_1 \geq 9$: data between n_1 and n_8 are valid, and data from n_9 to P_1 will be discarded.

Parameters n_1 and n_2

Parameters n_1 and n_2 are used to select the bar code type (the upper four bits are ignored).

n_1	n_2	Bar Code Type
0	1	EAN 8
0	2	EAN 13
1	0	UPC-A
1	4	UPC-E
2	0	Code 39
3	0	Interleaved 2 of 5
4	0	Code 128

Parameters n_3 and n_4

Parameters n_3 and n_4 specify the vertical bar code length in 6/72-inch units (the upper four bits are ignored).

Vertical bar code length : $[(n_3 \times 10) + n_4] \times 6/72$ -inch.

- $n_3 = n_4 = 0$: maintains the current setting.
- $[(n_3 \times 10) + n_4] \geq 25$: sets to 24.

Parameter n_5

Parameter n_5 specifies the width of the black bar.

The minimum black bar width is 1/72-inch.

- $n_5 = 0$: maintains the current setting.
- $n_5 \geq 8$: sets to 7.

Parameter n_6

Parameter n_6 specifies the space width.

The minimum space width is 1/72-inch.

- $n_6 = 0$: maintains the current setting.
- $n_6 \geq 8$: sets to 7.

Parameter n_7

Parameter n_7 specifies the ratio between the wide element and the narrow element.

n_7	<i>Ratio between wide and narrow elements</i>
1	2 to 1
2	2.5 to 1
3	3 to 1
4	3.5 to 1
5	4 to 1
6	4.5 to 1
7	5 to 1

- $n_7 = 0$: maintains the current setting.
- $n_7 \geq 8$: sets to 7.

Parameter n_8

Parameter n_8 specifies the character type (character size fixed at 12 cpi).

- $n_8 = 0$: none
- $n_8 = 1$: Utility
- $n_8 \geq 2$: NLQ

Print Bar Code Data Command

ASCII	Hexadecimal	Decimal
ESC DLE B p ₁ p _m <data>	1B 10 42 p ₁ n <data>	27 16 66 p ₁ n <data>

Parameter p₁

Parameter p₁ specifies the subsequent data amount (the MSB is ignored).

Parameter p_m

Parameter p_m selects mode A, B, or C of Code 128 bar codes. When another bar code type is selected, parameter p_m is ignored.

- p_m = 65: Code 128 mode A
- p_m = 66: Code 128 mode B
- p_m = 67: Code 128 mode C

<Data>

Indicates the bar code data.

Postnet Bar Code Command

ASCII	Hexadecimal	Decimal
ESC DLE C p ₁ <data>	1B 10 43 p ₁ <data>	27 16 67 p ₁ <data>

Parameter P₁

Parameter p₁ specifies the amount or data to follow (MSB is ignored).

- p₁ = 1 to 20

<Data>

Indicates the bar code data.

Custom Font Commands: Epson & IBM

Note: Custom characters are not saved when the printer is turned off.

Epson FX Custom Font Command

ASCII	Hexadecimal	Decimal
ESC & m n ₁ n ₂ a d ₁ ... d ₁₁	1B 26 m n ₁ n ₂ a d ₁ ... d ₁₁	27 38 m n ₁ n ₂ a d ₁ ... d ₁₁

This command is used to define up to 256 character patterns and store the patterns in RAM. The matrix size used to define the characters is 11 horizontal dot columns x 8 vertical dot columns. Used with Utility mode only.

The first portion of this command—ESC & NUL n₁ n₂—is used once to set up the printer for the characters to be stored.

The second portion of this command—a d₁ ... d₁₁—is used repeatedly, once for each character to be defined and stored.

Parameter m

Use NUL (00H, 0D) for parameter m. This parameter sets the area of RAM used to store the data.

Parameters n₁, n₂

Parameter n₁ is used to set the location of the first character to be redefined and parameter n₂ is used to set the location of the last character to be redefined.

If less than 256 characters are to be defined, all character locations (addresses) must be consecutive from the starting character.

- n₁, n₂ = 0 to 255 decimal

Parameter a

Parameter a sets the character type, according to the values assigned to its 8-bit definition.

- a = 0 to 255 decimal

Bit Definitions for Parameter a

Byte b_7

$b_7 = 1$: ascender, dot rows 1 to 8

$b_7 = 0$: descender, dot rows 2 to 9

Bytes b_6 to b_0

Bytes b_6 to b_4 are used to set the left side clearance.

b_6	b_5	b_4	<i>Clearance</i>
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

Bytes b_3 to b_0

Bytes b_3 to b_0 are used to set the right side clearance

b_3	b_2	b_1	b_0	<i>Clearance</i>
0	1	0	0	7
0	1	0	1	6
0	1	1	0	5
0	1	1	1	4
1	0	0	0	3
1	0	0	1	2
1	0	1	0	1
1	0	1	1	0

Parameters $d_1 \dots d_{11}$

Parameters d_1 through d_{11} are used to provide column data, repeated for each character to be defined. Each column of data = 1 byte; column 1 = byte 1.

- $d_1 \dots d_{11} = 0$ to 255 decimal

IBM Proprinter III Custom Fonts Command

ASCII	Hexadecimal	Decimal
ESC = c ₁ c ₂ m n a ₁ a ₂ d ₁ ...d ₁₁	1B 3D c ₁ c ₂ m n a ₁ a ₂ d ₁ ...d ₁₁	27 61 c ₁ c ₂ m n a ₁ a ₂ d ₁ ...d ₁₁

This command is used to define up to 256 character patterns and store the patterns in RAM.

Print Quality	Dot Columns	
	Horizontal	Vertical
Utility	11	8
NLQ (Near Letter Quality)	23	8

The first portion of this command—ESC = c₁ c₂ m n—is used once to set up the printer for the characters to be stored.

The second portion of this command—a₁ a₂ d₁...d₁₁—is used repeatedly, once for each character to be defined and stored.

Parameter c₁

Parameter c₁ is used to define the low byte of the total data count.

- c₁ = 0 to 255 decimal

Parameter c₂

Parameter c₂ is used to define the high byte of the total data count.

- c₂ = 0 to 255 decimal

Parameter m

Parameter m is used to set the print quality.

- m = 20: UTL
- m = 21: NLQ II/Alternate NLQ II

Parameter n

Parameter n sets the starting character in RAM to be defined as custom characters.

- n = 0 to 255 decimal

Parameter a_1

Parameter a_1 sets the character type.

- $a_1 = 0$ to 255 decimal

Bit definitions for parameter a_1

Bit b_7

$b_7 = 0$: ascender character

$b_7 = 1$: descender character

Bits b_6, b_5, b_4, b_3, b_2

Ignored

Bits b_1 and b_0

b_1	b_0	Meaning
0	0	Makes b_7 valid
0	1	Line draw, b_7 invalid
1	0	Shading, b_7 invalid
1	1	Extends NUL downwards by 4 dots, b_7 invalid

Parameter a_2

Parameter a_2 sets the amount of proportional spacing.

- $a_2 = 0$ to 255 decimal

Parameters d_1 through d_{11}

- $d_1 \dots d_{11} = 0$ to 255 decimal

Select Menu Item 1 Command

ASCII	Hexadecimal	Decimal
ESC DLE D Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	1B 10 44 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	27 16 68 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n

This command is used to set the menu.

Parameter Pno

Designates the number of parameter bytes since the designated number. Invalid with MSB.

- $00H \leq Pno \leq FFH$

Pno = 00H or 01H, an initial setting (menu setting for current conditions) will be performed, but the menu contents not be changed.

Parameter Pa

Determines the item number in the menu.

Bit 6 = 1 allows the recognition of Pa parameter.

MSB is invalid.

- $40H \leq Pa \leq 7FH$
- $C0H \leq Pa \leq FFH$

Parameter Pb

Pb : determines the setting values of the menu.

Bit 6 = 0 allows the recognition of Pa parameter.

MSB is invalid.

- $00H \leq Pb \leq FH$
- $0H \leq Pb \leq BFH$

Pa and Pb Values for Setting Menu Items

Group	Pa: $b_7 \dots b_0$	Item	Pb: $b_7 \dots b_0$	Setting
Printer Control	X1000000	Emulation mode	X0000000	IBM PPR
			X0000001	EPSON FX
			X0000010	ML
Font	X0000001	Print Mode	X0000000	Utility
			X0000001	NLQ Courier
			X0000010	NLQ Gothic
			X0000011	HSD
	X0000010	Pitch	X0000000	10 CPI
			X0000001	12 CPI
			X0000010	15 CPI
			X0000011	17 CPI
			X0000100	20 CPI
	X1000011	Proportional	X0000000	No Spacing
			X0000001	Yes
	X1000100	Style	X0000000	Normal
			X0000001	Italics
	X1000101	Size	X0000000	Single
			X0000001	Double
	X1000110	Character set	X0000000	Symbol Set I (Standard)
			X0000001	Set II (Line Graphics)
			X0000010	Block Graphics
	X1000111	Language Set	X0000000	American
			X0000001	French
			X0000010	German
			X0000011	British
			X0000100	Danish I

Group	Pa: b₇...b₀	Item	Pb: b₇...b₀	Setting
Font (cont.)	X1000111	Language Set	X0000101	Swedish
	(cont.)		X0000110	Italian
			X0000111	Spanish I
			X0001000	Japanese
			X0001001	Norwegian
			X0001010	Danish II
			X0001011	Spanish II
			X0001100	Latin American
			X0001101	French Canadian
			X0001110	Dutch
			X0001111	Publisher
Symbol Sets	X1001000	Zero Character	X0000000	Unslashed
			X0000001	Slashed
	X1001001	Code Page	X0000000	USA
			X0000001	Canada French
			X0000010	Multilingual
			X0000011	Portugal
			X0000100	Norway
			X0000101	BRASCII
			X0000110	Abicomp
Rear Feed	X1001010	Line Spacing	X0000000	6LPI
			X0000001	8LPI
	X1001011	Form Tear-Off	X0000000	Off
			X0000001	500ms
			X0000010	1sec
			X0000011	2sec

Group	Pa: b ₇ ...b ₀	Item	Pb: b ₇ ...b ₀	Setting
Rear Feed (cont.)	X1001100	Skip Over Perforation	X0000000	No
			X0000001	Yes
	X1001101	Page Width	X0000000	8"
			X0000001	13.6"
	X1001110	Page Length	X0000000	3"
			X0000001	3.5"
			X0000010	4"
			X0000011	5"
			X0000100	5.5"
			X0000101	6"
			X0000110	7"
			X0000111	8"
			X0001000	8.5"
			X0001001	11"
			X0001010	11 2/3"
			X0001011	12"
			X0001100	14"
			X0001101	17"
Front Feed	X1001111	Line Spacing	X0000000	6LPI
			X0000001	8LPI
	X1010000	Form Tear-Off	X0000000	Off
			X0000001	500ms
			X0000010	1sec
			X0000011	2sec
	X1010001	Skip Over Perforation	X0000000	No
			X0000001	Yes

Group	Pa: b ₇ ...b ₀	Item	Pb: b ₇ ...b ₀	Setting
Front Feed (cont.)	X1010010	Page Width	X0000000	8"
			X0000001	13.6"
	X1010011	Page Length	X0000000	3"
			X0000001	3.5"
			X0000010	4"
			X0000011	5"
			X0000100	5.5"
			X0000101	6"
			X0000110	7"
			X0000111	8"
			X0001000	8.5"
			X0001001	11"
			X0001010	11 2/3"
			X0001011	12"
			X0001100	14"
			X0001101	17"
Set-Up	X1100001	Graphics	X0000000	Bi-directional
			X0000001	Uni-directional
	X1100010	Paper Out Override	X0000000	No
			X0000001	Yes

Group	Pa: b ₇ ...b ₀	Item	Pb: b ₇ ...b ₀	Setting
Set-Up (cont.)	X1100011	Print Registration 1	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X0000101	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
	X1100100	Operator Panel Function	X0000000	Full Operation
			X0000001	Limited Operation
	X1100101	Reset Inhibit	X0000000	No
			X0000001	Yes
	X1100110	Print Suppress Effective	X0000000	No
			X0000001	Yes
	X1100111	Auto LF	X0000000	No
			X0000001	Yes
			X1101000	Auto CR
			X0000000	No
			X0000001	Yes
	X1101010	SI Select Pitch (10CPI)	X0000000	15CPI

Group	Pa: b ₇ ...b ₀	Item	Pb: b ₇ ...b ₀	Setting
Set-Up (cont.)	X1101011	SI Select Pitch (12CPI)	X0000001	17.1CPI
			X0000000	12CPI
			X0000001	20CPI
	X1101100	Time Out Print	X0000000	Invalid
			X0000001	Valid
	X1101101	Auto Select	X0000000	No
			X0000001	Yes
	X1110010	Print DEL Code	X0000000	No
			X0000001	Yes
	X1110011	7/8 Bits Graphics	X0000000	7 Bits
			X0000001	8 Bits
	X1110100	7/8 Bits Data Word	X0000000	7 Bits
			X0000001	8 Bits
	X1111010	ESC SI Pitch	X0000000	17.1CPI
			X0000001	20 CPI
	X1111011	Intr Chr Sub Set	X0000000	Combined
			X0000001	Code Page Only
	X1111100	Default Path	X0000000	Current Path
			X0000001	Rear Path
			X0000010	Front Path
	X1111101	Auto Path	X0000000	Invalid
			X0000001	Valid

Group	Pa: b ₇ ...b ₀	Item	Pb: b ₇ ...b ₀	Setting
Set-Up (cont.)	X1111110	Impact Mode	X0000000	Normal
			X0000001	Quiet
			X0000010	Hi Copy
	X1111111	LF Speed	X0000000	Fast
			X0000001	Slow

Select Menu Item 2 Command

ASCII	Hexadecimal	Decimal
ESC DLE E Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	1B 10 45 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n	27 16 69 Pno Pa ₁ Pb ₁ Pa ₂ Pb ₂ ...Pa _n Pb _n

This command supplements the Select Menu Item 1 command, providing additional menu items.

Parameter Pno

Designates the number of parameter bytes since the designated number. Invalid with MSB.

- $00H \leq Pno \leq FFH$

Pno = 00H or 01H, an initial setting (menu setting for current conditions) will be performed, but the menu contents not be changed.

Parameter Pa

Determines the item number in the menu.

Bit 6 = 1 allows the recognition of Pa parameter.

MSB is invalid.

- $40H \leq Pa \leq 7FH$
- $C0H \leq Pa \leq FFH$

Parameter Pb

Determines the setting values of the menu.

Bit 6 = 0 allows the recognition of Pa parameter.

MSB is invalid.

- $00H \leq Pb \leq 3FH$
- $80H \leq Pb \leq BFH$

Pa and Pb Values for Setting Menu Items

Group	Pa: $b_7 \dots b_0$	Item	Pb: $b_7 \dots b_0$	Setting
Set-Up	X1000000	Gap Control (Rear)	X0000000	Auto
			X0000001	1P
			X0000010	2P
			X0000011	3P
			X0000100	4P
			X0000101	5P
			X0000110	6P
			X0000111	7P
			X0001000	8P
			X0001001	9P
			X0001010	10P
	X1000001	Gap Control (Front)	X0000000	Auto
			X0000001	1P
			X0000010	2P
			X0000011	3P
			X0000100	4P
			X0000101	5P
			X0000110	6P
			X000011	7P
			X0001000	8P
			X0001001	9P
			X0001010	10P

Group	Pa: $b_7 \dots b_0$	Item	Pb: $b_7 \dots b_0$	Setting
Set-Up (cont.)	X1000101	Print Registration 2	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X0000101	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
	X1000110	Print Registration 3	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X0000101	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left

Group	Pa: $b_7 \dots b_0$	Item	Pb: $b_7 \dots b_0$	Setting
Set-Up (cont.)	X1000111	Print Registration 4	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X000010	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
	X1001000	Print Registration 5	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X000010	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
			X0001010	0.25mm Left

Group	Pa: $b_7 \dots b_0$	Item	Pb: $b_7 \dots b_0$	Setting
Set-Up (cont.)	X1001001	Print Registration 6	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X000010	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
			X0001010	0.25mm Left
	X1001010	Print Registration 7	X0000000	0.25mm Right
			X0000001	0.20mm Right
			X0000010	0.15mm Right
			X0000011	0.10mm Right
			X0000100	0.05mm Right
			X000010	0
			X0000110	0.05mm Left
			X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
			X0001010	0.25mm Left

Group	Pa: $b_7 \dots b_0$	Item	Pb: $b_7 \dots b_0$	Setting
Set-Up (cont.)	X1000101	Print Registration 7 (cont.)	X0000111	0.10mm Left
			X0001000	0.15mm Left
			X0001001	0.20mm Left
			X0001010	0.25mm Left
			X0001010	0.25mm Left
X1001010	Page Width Control		X0000000	Invalid
			X0000001	Mode 1
			X0000010	Mode 2

D: Hex Dump Mode

Running a Hexadecimal Dump

When the printer is in the Hex Dump Mode, all data received, including text and printer commands, will be printed in both hexadecimal and ASCII format.

Note: In the ASCII format, all non-printable characters will be represented by a period.

Engaging the Hex Dump Mode

To engage the Hex Dump Mode:

1. Be sure paper is loaded.
2. Turn the printer off.
3. Press and hold FF/LOAD while turning the printer on.

The printer will print the line “Hex Data Dump” and be ready to receive data in the Hex Dump Mode.

Running a Hex Dump Test

To run the test, send data to the printer while it is in the Hex Dump Mode.

Exiting Hex Dump Mode

There are two ways to exit the Hex Dump Mode:

- Hold **SHIFT** and press **ON-LINE/RESET** .

OR

- Turn the printer off, then on again.

E: Character Sets

Lower ASCII Character Sets

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Set 1	IBM Set 2 ML Set 2	IBM Set 3	ML Set 1
00	0	NUL	NUL	NUL	NUL	Ø	STX ETX
01	1					⊙	
02	2					●	
03	3				♥	♥	
04	4				♦	♦	
05	5				♣	♣	
06	6				♠	♠	
07	7					•	BS HT LF VT FF CR SO SI
08	8	BS	BS	BS	BS	■	
09	9	HT	HT	HT	HT	○	
0A	10	LF	LF	LF	LF	■	
0B	11	VT	VT	VT	VT	♂	
0C	12	FF	FF	FF	FF	♀	
0D	13	CR	CR	CR	CR	♪	
0E	14	SO	SO	SO	SO	♫	DC1 DC2 DC3 DC4
0F	15	SI	SI	SI	SI	⚙	
10	16					▶	
11	17	DC1	DC1	DC1	DC1	◀	
12	18	DC2	DC2	DC2	DC2	↑	
13	19	DC3	DC3		DC3	||	
14	20	DC4	DC4	DC4	DC4	¶	
15	21		§		§	§	CAN EM
16	22					-	
17	23					⋮	
18	24	CAN	CAN	CAN	CAN	↑	
19	25	EM	EM	EM	EM	↓	
1A	26					→	
1B	27	ESC	ESC	ESC	ESC	←	ESC FS GS RS US
1C	28					└	
1D	29					↔	
1E	30					▲	
1F	31					▼	
20	32	Space	Space	Space	Space	Space	Space

Lower ASCII Character Sets (continued)

Hex.	Dec.	Epson Sets 1 & 2	IBM Set 1	IBM Set 2 ML Set 2	IBM Set 3	ML Set 1
21	33	!	!	!	!	!
22	34	"	"	"	"	"
23	35	#	#	#	#	#
24	36	\$	\$	\$	\$	\$
25	37	%	%	%	%	%
26	38	&	&	&	&	^
27	39	,	,	,	,	,
28	40	(((((
29	41)))))
2A	42	*	*	*	*	*
2B	43	+	+	+	+	+
2C	44	,	,	,	,	,
2D	45	-	-	-	-	-
2D	46	.	.	.	.	.
2F	47	/	/	/	/	/
30	48	0	0	0	0	0
31	49	1	1	1	1	1
32	50	2	2	2	2	2
33	51	3	3	3	3	3
34	52	4	4	4	4	4
35	53	5	5	5	5	5
36	54	6	6	6	6	6
37	55	7	7	7	7	7
38	56	8	8	8	8	8
39	57	9	9	9	9	9
3A	58	:	:	:	:	:
3B	59	;	:	:	:	:
3C	60	<	<	<	<	<
3D	61	=	=	=	=	=
3E	62	>	>	>	>	>
3F	63	?	?	?	?	?
40	64	@	@	@	@	@
41	65	A	A	A	A	A

Lower ASCII Character Sets (continued)

Hex.	Dec.	Epson Sets 1 & 2	IBM Set 1	IBM Set 2 ML Set 2	IBM Set 3	ML Set 1
42	66	B	B	B	B	B
43	67	C	C	C	C	C
44	68	D	D	D	D	D
45	69	E	E	E	E	E
46	70	F	F	F	F	F
47	71	G	G	G	G	G
48	72	H	H	H	H	H
49	73	I	I	I	I	I
4A	74	J	J	J	J	J
4B	75	K	K	K	K	K
4C	76	L	L	L	L	L
4D	77	M	M	M	M	M
4E	78	N	N	N	N	N
4F	79	O	O	O	O	O
50	80	P	P	P	P	P
51	81	Q	Q	Q	Q	Q
52	82	R	R	R	R	R
53	83	S	S	S	S	S
54	84	T	T	T	T	T
55	85	U	U	U	U	U
56	86	V	V	V	V	V
57	87	W	W	W	W	W
58	88	X	X	X	X	X
59	89	Y	Y	Y	Y	Y
5A	90	Z	Z	Z	Z	Z
5B	91	[[[[[
5C	92	\	\	\	\	\
5D	93]]]]]
5E	94	^	^	^	^	^
5F	95	_	_	_	_	_
60	96	`	`	`	`	`

Lower ASCII Character Sets (continued)

Hex.	Dec.	Epson Sets 1 & 2	IBM Set 1	IBM Set 2 ML Set 2	IBM Set 3	ML Set 1
61	97	a	a	a	a	a
62	98	b	b	b	b	b
63	99	c	c	c	c	c
64	100	d	d	d	d	d
65	101	e	e	e	e	e
66	102	f	f	f	f	f
67	103	g	g	g	g	g
68	104	h	h	h	h	h
69	105	i	i	i	i	i
6A	106	j	j	j	j	j
6B	107	k	k	k	k	k
6C	108	l	l	l	l	l
6D	109	m	m	m	m	m
6E	110	n	n	n	n	n
6F	111	o	o	o	o	o
70	112	p	p	p	p	p
71	113	q	q	q	q	q
72	114	r	r	r	r	r
73	115	s	s	s	s	s
74	116	t	t	t	t	t
75	117	u	u	u	u	u
76	118	v	v	v	v	v
77	119	w	w	w	w	w
78	120	x	x	x	x	x
79	121	y	y	y	y	y
7A	122	z	z	z	z	z
7B	123	{	{	{	{	{
7C	124	|	|	|	|	|
7D	125	}	}	}	}	}
7E	126	~	~	~	~	~
7F	127	DEL			␣	DEL

Upper ASCII Character Sets

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Set 1	IBM Sets 2 & 3 ML Set 2	ML Set 1
80	128		Ç	NUL	Ç	
81	129		ù		ù	
82	130		é		é	STX
83	131		â		â	ETX
84	132		ä		ä	
85	133		à		à	
86	134		å		å	
87	135		ç		ç	
88	136	BS	ê	BS	ê	BS
89	137	HT	ë	HT	ë	HT
8A	138	LF	è	LF	è	LF
8B	139	VT	ï	VT	ï	VT
8C	140	FF	î	FF	î	FF
8D	141	CR	ì	CR	ì	CR
8E	142	SO	À	SO	À	SO
8F	143	SI	Á	SI	Á	SI
90	144		Ê		Ê	
91	145	DC1	æ	DC1	æ	DC1
92	146	DC2	Æ	DC2	Æ	DC2
93	147	DC3	ô		ô	DC3
94	148	DC4	ö	DC4	ö	DC4
95	149		ò		ò	
96	150		û		û	
97	151		ù		ù	
98	152	CAN	ÿ	CAN	ÿ	CAN
99	153	EM	Ö	EM	Ö	EM
9a	154		Û		Û	
9B	155	ESC	€	ESC	€	ESC
9C	156		£		£	FS
9D	157		¥		¥	GS
9E	158		₤		₤	RS
9F	159		f		f	US
A0	160	Space	á	á	á	á

Upper ASCII Character Sets (continued)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Sets 1, 2 & 3 ML Sets 1 & 2
A1	161	!	í	í
A2	162	"	ó	ó
A3	163	#	ú	ú
A4	164	\$	ñ	ñ
A5	165	%	Ñ	Ñ
A6	166	&	•	•
A7	167	'	•	•
A8	168	(¿	¿
A9	169)	¡	¡
AA	170	*	¡	¡
AB	171	+	½	½
AC	172	,	¼	¼
AD	173	-	¡	¡
AE	174	.	•	•
AF	175	/	•	•
B0	176	0	•	•
B1	177	1	•	•
B2	178	2	•	•
B3	179	3	•	•
B4	180	4	•	•
B5	181	5	•	•
B6	182	6	•	•
B7	183	7	•	•
B8	184	8	•	•
B9	185	9	•	•
BA	186	:	•	•
BB	187	;	•	•
BC	188	<	•	•
BD	189	=	•	•
BE	190	>	•	•
BF	191	?	•	•
C0	192	@	•	•
C1	193	A	•	•

Upper ASCII Character Sets (continued)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Sets 1, 2 & 3 ML Sets 1 & 2
C2	194	B	T	T
C3	195	C	┐	┐
C4	196	D	—	—
C5	197	E	+	+
C6	198	F	┐	┐
C7	199	G	┐	┐
C8	200	H	┐	┐
C9	201	I	┐	┐
CA	202	J	┐	┐
CB	203	K	┐	┐
CC	204	L	┐	┐
CD	205	M	=	=
CE	206	N	┐	┐
CF	207	O	┐	┐
D0	208	P	┐	┐
D1	209	Q	┐	┐
D2	210	R	┐	┐
D3	211	S	┐	┐
D4	212	T	┐	┐
D5	213	U	┐	┐
D6	214	V	┐	┐
D7	215	W	┐	┐
D8	216	X	┐	┐
D9	217	Y	┐	┐
DA	218	Z	┐	┐
DB	219	/	■	■
DC	220	\	■	■
DD	221	/	■	■
DE	222	^	■	■
DF	223	-	■	■
E0	224	·	α	α

Upper ASCII Character Sets (continued)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Sets 1, 2 & 3 ML Sets 1 & 2
E1	225	<i>a</i>	β	β
E2	226	<i>b</i>	Γ	Γ
E3	227	<i>c</i>	π	π
E4	228	<i>d</i>	Σ	Σ
E5	229	<i>e</i>	σ	σ
E6	230	<i>f</i>	μ	μ
E7	231	<i>g</i>	τ	τ
E8	232	<i>h</i>	Φ	Φ
E9	233	<i>i</i>	Θ	Θ
EA	234	<i>j</i>	Ω	Ω
EB	235	<i>k</i>	δ	δ
EC	236	<i>l</i>	∞	∞
ED	237	<i>m</i>	\emptyset	\emptyset
EE	238	<i>n</i>	ε	ε
EF	239	<i>o</i>	\cup	\cup
F0	240	<i>p</i>	\equiv	\equiv
F1	241	<i>q</i>	\pm	\pm
F2	242	<i>r</i>	\geq	\geq
F3	243	<i>s</i>	\leq	\leq
F4	244	<i>t</i>	\int	\int
F5	245	<i>u</i>	\int	\int
F6	246	<i>v</i>	\div	\div
F7	247	<i>w</i>	\approx	\approx
F8	248	<i>x</i>	\circ	\circ
F9	249	<i>y</i>	\bullet	\bullet
FA	250	<i>z</i>	\cdot	\cdot
FB	251	{	$\sqrt{\quad}$	$\sqrt{\quad}$
FC	252	|	n	n
FD	253	}	2	2
FE	254	~	■	■
FF	255	DEL	Space	Space

Epson International Character Substitutions

		35	36	38	64	79	91	92	93	94	95	96	123	124	125	126
American	0	#	\$	&	@	O	[	\	\]	^	-	'	{	|	}	~
British	3	£	\$	&	@	O	[	\	\]	^	-	'	{	|	}	~
Danish I	4	#	\$	&	@	O	Æ	Ø	Å	^	-	'	æ	ø	å	~
Danish II	10	#	\$	&	É	O	Æ	Ø	Å	Ü	-	é	æ	ø	å	ü
Dutch	14	£	\$	&	@	O	[	Π	]	^	-	'	{	Π	}	~
French	1	#	\$	&	à	O	•	ç	§	^	-	'	é	ù	è	~
French Canadian	13	ü	\$	ë	à	Ø	â	ç	ê	†	Ï	û	é	ù	è	û
German	2	#	\$	&	§	O	Ä	Ö	Ü	^	-	'	ä	ö	ü	ß
Italian	6	#	\$	&	@	O	•	\	é	^	-	ù	à	ò	è	ì
Japanese	8	#	\$	&	@	O	[	¥	]	^	-	'	{	|	}	~
Latin American	12	#	\$	&	á	O	í	Ñ	¿	é	-	ü	í	ñ	ó	ú
Norwegian	9	#	□	&	É	O	Æ	Ø	Å	Ü	-	é	æ	ø	å	ü
Publisher	64	#	\$	&	§	O	•	'	"	¶	±	'	©	®	†	™
Spanish I	7	£	\$	&	@	O	í	Ñ	¿	^	-	'	~	ñ	|	~
Spanish II	11	#	\$	&	à	O	í	Ñ	¿	é	-	'	í	ñ	ó	ú
Swedish	5	#	□	&	É	O	Ä	Ö	Å	Ü	-	é	ä	ö	å	ü

IBM International Character Substitutions

		35	36	38	48	64	79	91	92	93	94	95	96	123	124	125	126
American (slashed zero)	64	#	\$	&	Ø	@	O	[	\	\]	^	-	'	{	|	}	~
American (unslashed zero)	65	#	\$	&	0	@	O	[	\	\]	^	-	'	{	|	}	~
British	66	£	\$	&	0	@	O	[	\	\]	^	-	'	{	|	}	~
Danish	70	#	\$	&	0	@	O	Æ	Ø	Å	Ü	-	'	æ	ø	å	ü
Dutch	72	£	\$	&	0	@	O	[	Π	]	^	-	'	{	Π	}	~
French	68	£	\$	&	0	à	O	•	ç	§	^	-	'	é	ù	è	ê
French Canadian	74	ü	\$	ë	0	à	Ø	â	ç	ê	†	Ï	ô	é	ù	è	û
German	67	#	\$	&	0	§	O	Ä	Ö	Ü	^	-	'	ä	ö	ü	ß
Italian	73	£	\$	&	0	§	O	•	ç	é	^	-	ù	à	ò	è	ì
Latin American	76	#	\$	&	0	à	O	í	Ñ	¿	é	-	ü	í	ñ	ó	ú
Norwegian	71	#	\$	&	0	@	O	Æ	Ø	Å	^	-	'	æ	ø	å	~
Publisher	90	#	\$	&	0	§	O	•	'	"	¶	±	'	©	®	†	™
Spanish	75	!	\$	&	0	í	O	Ñ	ñ	¿	ü	-	á	é	í	ó	ú
Swedish	69	§	□	&	0	É	O	Ä	Ö	Å	^	-	é	ä	ö	å	ü

Microline Standard International Character Substitutions

	35	36	38	48	64	79	91	92	93	94	95	96	123	124	125	126
American (slashed zero)	#	\$	&	Ø	@	O	[	\	\]	^	_	'	{	|	}	~
American (unslashed zero)	#	\$	&	0	@	O	[	\	\]	^	_	'	{	|	}	~
British	£	\$	&	0	@	O	[	\	\]	^	_	'	{	|	}	~
Danish	#	\$	&	0	@	O	Æ	Ø	Å	Ü	_	'	æ	ø	å	ü
Dutch	£	\$	&	0	@	O	[	II	]	^	_	'	{	ij	}	~
French	£	\$	&	0	à	O	·	ç	§	^	_	'	é	ü	è	ê
French Canadian	ü	\$	ë	0	à	Ø	â	ç	ê	î	ï	ô	é	ù	è	û
German	#	\$	&	0	§	O	Ä	Ö	Ü	^	_	'	ä	ö	ü	ß
Italian	£	\$	&	0	§	O	·	ç	é	^	_	ù	à	ò	è	ì
Norwegian	#	\$	&	0	@	O	Æ	Ø	Å	^	_	'	æ	ø	å	~
Publisher	#	\$	&	0	§	O	·	'	"	¶	±	'	©	®	†	™
Spanish	!	\$	&	0	¡	O	Ñ	ñ	¿	ü	_	á	é	í	ó	ú
Swedish	§	□	&	0	É	O	Ä	Ö	Å	^	_	é	ä	ö	å	ü

Code Page Character Sets

The characters in the lower ASCII range (hexadecimal 00 through 7E, decimal 0 through 127) are the same as IBM Set 3. The characters for the upper ASCII range are given in the tables below.

Hex.	Dec.	Code Page				
		1 USA Courier	2 USA Multilingual Courier	3 Canadian French	4 Portugal Courier	5 Norway Courier
80	128	Ç	Ç	Ç	Ç	Ç
81	129	ù	ù	ù	ù	ù
82	130	é	é	é	é	é
83	131	â	â	â	â	â
84	132	ã	ã	Ã	ã	ã
85	133	ä	ä	ä	ä	ä
86	134	å	å	¶	Á	å
87	135	ç	ç	ç	ç	ç
88	136	ê	ê	ê	ê	ê
89	137	ë	ë	ë	Ê	ë
8A	138	è	è	è	è	è
8B	139	í	í	í	Í	í
8C	140	î	î	î	Ô	î
8D	141	ï	ï	=	í	ï
8E	142	Ä	Ä	À	Ä	Ä
8F	143	Å	Å	§	Å	Å
90	144	É	É	É	É	É
91	145	æ	æ	È	À	æ
92	146	Æ	Æ	Ê	È	Æ
93	147	ô	ô	ô	ô	ô
94	148	ö	ö	Ë	ö	ö
95	149	ò	ò	Ì	ò	ò
96	150	û	û	û	Ú	û
97	151	ü	ü	ü	ù	ü
98	152	ý	ý	□	ì	ý
99	153	Û	Û	Ò	Ô	Û
9a	154	Ü	Ü	Û	Û	Ü
9B	155	ø	ø	ø	ø	ø
9C	156	£	£	£	£	£
9D	157	¥	Ø	Ù	Ù	Ø
9E	158	ƒ	X	Û	ƒ	ƒ
9F	159	f	f	f	Ó	f
A0	160	á	á	í	á	á

Code Page Character Sets (continued)

Hex.	Dec.	Code Page				
		1 USA Courier	2 USA Multilingual Courier	3 Canadian French	4 Portugal Courier	5 Norway Courier
A1	161	í	í	´	í	í
A2	162	ó	ó	ó	ó	ó
A3	163	ú	ú	ú	ú	ú
A4	164	ñ	ñ	"	ñ	ñ
A5	165	Ñ	Ñ	,	Ñ	Ñ
A6	166	ª	ª	3	ª	ª
A7	167	º	º	-	º	º
A8	168	¿	¿	Î	¿	¿
A9	169	¸	®	¸	Ô	¸
AA	170	¸	¸	¸	¸	¸
AB	171	½	½	½	½	½
AC	172	¼	¼	¼	¼	¼
AD	173	¡	¡	¾	¡	¡
AE	174	«	«	«	«	«
AF	175	»	»	»	»	»
B0	176					
B1	177					
B2	178					
B3	179					
B4	180					
B5	181					
B6	182					
B7	183					
B8	184					
B9	185					
BA	186					
BB	187					
BC	188					
BD	189					
BE	190					
BF	191					
C0	192					
C1	193	¡		¡	¡	¡

Code Page Character Sets (continued)

Hex.	Dec.	Code Page				
		1 USA Courier	2 USA Multilingual Courier	3 Canadian French	4 Portugal Courier	5 Norway Courier
C2	194	T	T	T	T	T
C3	195	┐	┐	┐	┐	┐
C4	196	—	—	—	—	—
C5	197	+	+	+	+	+
C6	198	ƒ	ã	ƒ	ƒ	ƒ
C7	199	ll	Ã	ll	ll	ll
C8	200	ll	ll	ll	ll	ll
C9	201	ll	ll	ll	ll	ll
CA	202	ll	ll	ll	ll	ll
CB	203	ll	ll	ll	ll	ll
CC	204	ll	ll	ll	ll	ll
CD	205	=	=	=	=	=
CE	206	ll	ll	ll	ll	ll
CF	207	ll	ø	ll	ll	ll
D0	208	ll	ø	ll	ll	ll
D1	209	ll	Ð	ll	ll	ll
D2	210	ll	Ê	ll	ll	ll
D3	211	ll	Ê	ll	ll	ll
D4	212	ll	Ê	ll	ll	ll
D5	213	ƒ	ı	ƒ	ƒ	ƒ
D6	214	ll	ı	ll	ll	ll
D7	215	ll	ı	ll	ll	ll
D8	216	ll	ı	ll	ll	ll
D9	217	ll	ı	ll	ll	ll
DA	218	ll	ll	ll	ll	ll
DB	219	ll	ll	ll	ll	ll
DC	220	ll	ll	ll	ll	ll
DD	221	ll	ll	ll	ll	ll
DE	222	ll	ll	ll	ll	ll
DF	223	ll	ll	ll	ll	ll
E0	224	α	Ó	α	α	α

Code Page Character Sets (continued)

Hex.	Dec.	Code Page				
		1 USA Courier	2 USA Multilingual Courier	3 Canadian French	4 Portugal Courier	5 Norway Courier
E1	225	β	β	β	β	β
E2	226	Γ	Ô	Γ	Γ	Γ
E3	227	π	Ò	π	π	π
E4	228	Σ	ô	Σ	Σ	Σ
E5	229	σ	Ö	σ	σ	σ
E6	230	μ	μ	μ	μ	μ
E7	231	τ	ƒ	τ	τ	τ
E8	232	Φ	ƒ	Φ	Φ	Φ
E9	233	Θ	Û	Θ	Θ	Θ
EA	234	Ω	Û	Ω	Ω	Ω
EB	235	δ	Û	δ	δ	δ
EC	236	∞	ý	∞	∞	∞
ED	237	ø	Ý	ø	ø	ø
EE	238	ε	-	ε	ε	ε
EF	239	Ɔ	-	Ɔ	Ɔ	Ɔ
F0	240	≡	-	≡	≡	≡
F1	241	±	±	±	±	±
F2	242	≥	=	≥	≥	≥
F3	243	≤	¾	≤	≤	≤
F4	244	∫	¶	∫	∫	∫
F5	245	∫	§	∫	∫	∫
F6	246	÷	÷	÷	÷	÷
F7	247	≈	.	≈	≈	≈
F8	248	°	°	°	°	°
F9	249	•	"	•	•	•
FA	250	·	·	·	·	·
FB	251	√	1	√	√	√
FC	252	n	3	n	n	n
FD	253	2	2	2	2	2
FE	254	■	■	■	■	■
FF	255	Space	Space	Space	Space	Space

IBM Multilingual Code Page Sets

Hex.	Dec.	IBM Set		
		1	2	3
80	128	NUL	Ç	Ç
81	129		ü	ü
82	130		é	é
83	131		â	â
84	132		ä	ä
85	133		à	à
86	134		á	á
87	135		ç	ç
88	136	BS	ê	ê
89	137	HT	ë	ë
8A	138	LF	è	è
8B	139	VT	ı	ı
8C	140	FF	î	î
8D	141	CR	ì	ì
8E	142	SO	Ä	Ä
8F	143	SI	Å	Å
90	144		Ê	Ê
91	145	DC1	æ	æ
92	146	DC2	Æ	Æ
93	147		ô	ô
94	148	DC4	ö	ö
95	149		ù	ù
96	150		û	û
97	151		ü	ü
98	152	CAN	ÿ	ÿ
99	153	EM	Ö	Ö
9a	154		Û	Û
9B	155	ESC	ø	ø
9C	156		£	£
9D	157		Ø	Ø
9E	158		x	Þ
9F	159		f	f
A0	160	á	á	á

Hex.	Dec.	IBM Set		
		1	2	3
A1	161	í	í	í
A2	162	ó	ó	ó
A3	163	ú	ú	ú
A4	164	ñ	ñ	ñ
A5	165	Ñ	Ñ	Ñ
A6	166	ª	ª	ª
A7	167	º	º	º
A8	168	¿	¿	¿
A9	169	®	®	®
AA	170	¬	¬	¬
AB	171	½	½	½
AC	172	¼	¼	¼
AD	173	ı	ı	ı
AE	174	«	«	«
AF	175	»	»	»
B0	176	■	■	■
B1	177	■	■	■
B2	178	■	■	■
B3	179	┐	┐	┐
B4	180	┐	┐	┐
B5	181	Á	Á	Á
B6	182	Â	Â	Â
B7	183	Ã	Ã	Ã
B8	184	©	©	©
B9	185	║	║	║
BA	186	║	║	║
BB	187	╗	╗	╗
BC	188	╗	╗	╗
BD	189	¢	¢	¢
BE	190	¥	¥	¥
BF	191	┐	┐	┐
C0	192	┐	┐	┐
C1	193	┐	┐	┐

IBM Multilingual Code Page Sets (continued)

Hex.	Dec.	IBM Set		
		1	2	3
C2	194	Ƨ	Ƨ	Ƨ
C3	195	Ƨ	Ƨ	Ƨ
C4	196	—	—	—
C5	197	+	+	+
C6	198	ā	ā	ā
C7	199	Ā	Ā	Ā
C8	200	ℓ	ℓ	ℓ
C9	201	ℓ	ℓ	ℓ
CA	202	ℓ	ℓ	ℓ
CB	203	ℓ	ℓ	ℓ
CC	204	ℓ	ℓ	ℓ
CD	205	=	=	=
CE	206	≠	≠	≠
CF	207	□	□	±
D0	208	ø	ø	ℓ
D1	209	Đ	Đ	Ƨ
D2	210	Ê	Ê	π
D3	211	Ê	Ê	ℓ
D4	212	Ê	Ê	ℓ
D5	213	í	í	Ƨ
D6	214	í	í	Ƨ
D7	215	í	í	Ƨ
D8	216	í	í	Ƨ
D9	217	」	」	」
DA	218	┐	┐	┐
DB	219	■	■	■
DC	220	■	■	■
DD	221	┐	┐	┐
DE	222	┐	┐	┐
DF	223	■	■	■
E0	224	Ó	Ó	α

Hex.	Dec.	IBM Set		
		1	2	3
E1	225	β	β	β
E2	226	Ö	Ö	Γ
E3	227	Ö	Ö	π
E4	228	ö	ö	Σ
E5	229	Ö	Ö	σ
E6	230	μ	μ	μ
E7	231	ρ	ρ	τ
E8	232	ρ	ρ	Φ
E9	233	Û	Û	Θ
EA	234	Û	Û	Ω
EB	235	Û	Û	δ
EC	236	ý	ý	∞
ED	237	Ÿ	Ÿ	ø
EE	238	-	-	ε
EF	239	·	·	∩
F0	240	-	-	≡
F1	241	±	±	±
F2	242	=	=	≥
F3	243	¾	¾	≤
F4	244	¶	¶	∫
F5	245	§	§	∫
F6	246	÷	÷	÷
F7	247	·	·	≈
F8	248	°	°	°
F9	249	"	"	•
FA	250	·	·	·
FB	251	1	1	√
FC	252	3	3	n
FD	253	2	2	2
FE	254	■	■	■
FF	255	Space	Space	Space

Multilingual 858 Code Page Character Set

The characters in the lower ASCII range are the same as IBM Set 3.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80																
90																
A0		;	¢	£	€	¥	§	§	§	0	2	«	¬	-	0	-
B0	•	±	²	³	ž	µ	¶	·	ž	¹	º	»	®	œ	ÿ	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

ISO 8859-15 Code Page Character Set

The characters in the lower ASCII range are the same as IBM Set 3.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80	Ç	ü	é	à	ä	à	ä	ç	è	ë	è	ï	í	ì	Ä	À
90	é	æ	Æ	ò	ö	ò	ü	ù	ÿ	ö	ü	ø	£	Ø	×	ƒ
A0	á	í	ó	ú	ñ	Ñ	ú	º	¿	0	¬	½	¾	¿	«	»
B0	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
C0	Ł	ł	Ť	ť	—	†	‡	ˆ	˜	˘	˙	˚	˛	˜	˝	˝
D0	ó	ß	ö	ö	ø	ø	µ	þ	þ	ú	Ů	Ů	Ů	Ů	Ů	Ů
E0	ó	ß	ö	ö	ø	ø	µ	þ	þ	ú	Ů	Ů	Ů	Ů	Ů	Ů
F0	-	±	=	‰	¶	§	÷	,	o	„	.	ı	3	2	■	■

Epson BRASCII Character Set

160	161	;	162	¢	163	£	164	¤	165	¥	166	;	167	§	168	0
170	¸	171	«	¬	173	-	174	0	175	-	176	•	177	±	178	³
180	·	181	µ	¶	183	·	184	,	185	¹	186	º	187	»	¼	½
190	¾	191	¿	À	193	Á	194	Â	195	Ã	196	Ä	197	Å	198	Æ
200	Ç	201	È	202	É	203	Ê	204	Ë	205	Ì	206	Í	207	Î	208
210	Ï	211	Ð	212	Ñ	213	Ò	214	Ó	215	Ô	216	Õ	217	Ö	218
220	Ø	221	Ù	222	Ú	223	Û	224	Ü	225	Ý	226	Þ	227	ß	228
230	à	231	á	232	â	233	ã	234	ä	235	å	236	æ	237	ç	238
240	è	241	é	242	ê	243	ë	244	ì	245	í	246	î	247	ï	248
250	ð	251	ñ	252	ò	253	ó	254	ô	255	õ	256	ö	257	÷	258

Epson Abicomp Character Set

160	161	À	162	Á	163	Â	164	Ã	165	Ä	166	Ç	167	È	168	É
170	Ê	171	Ì	172	Í	173	Î	174	Ï	175	Ñ	176	Ò	177	Ó	178
180	Ô	181	Ö	182	Ù	183	Ú	184	Û	185	Ü	186	Ý	187	ˆ	188
190	§	191	°	192	±	193	²	194	³	195	¼	196	½	197	¾	198
200	¿	201	À	202	Á	203	Â	204	Ã	205	Ä	206	Å	207	Æ	208
210	Ç	211	È	212	É	213	Ê	214	Ë	215	Ì	216	Í	217	Î	218
220	Ï	221	Ð	222	Ñ	223	Ò	224	Ó	225	Ô	226	Õ	227	Ö	228
230	Ø	231	Ù	232	Ú	233	Û	234	Ü	235	Ý	236	Þ	237	ß	238
240	à	241	á	242	â	243	ã	244	ä	245	å	246	æ	247	ç	248
250	è	251	é	252	ê	253	ë	254	ì	255	í	256	î	257	ï	258

OKI Block Graphics Character Set

The following characters are available in the upper range of the OKI Block Graphics character set. Non-printing areas are represented by the white boxes on the grid. The decimal and hexadecimal values are printed to the left of each character.

128 80		144 90		160 A0		176 B0		192 C0		208 D0		224 E0		240 F0	
129 81		145 91		161 A1		177 B1		193 C1		209 D1		225 E1		241 F1	
130 82		146 92		162 A2		178 B2		194 C2		210 D2		226 E2		242 F2	
131 83		147 93		163 A3		179 B3		195 C3		211 D3		227 E3		243 F3	
132 84		148 94		164 A4		180 B4		196 C4		212 D4		228 E4		244 F4	
133 85		149 95		165 A5		181 B5		197 C5		213 D5		229 E5		245 F5	
134 86		150 96		166 A6		182 B6		198 C6		214 D6		230 E6		246 F6	
135 87		151 97		167 A7		183 B7		199 C7		215 D7		231 E7		247 F7	
136 88		152 98		168 A8		184 B8		200 C8		216 D8		232 E8		248 F8	
137 89		153 99		169 A9		185 B9		201 C9		217 D9		233 E9		249 F9	
138 8A		154 9A		170 AA		186 BA		202 CA		218 DA		234 EA		250 FA	
139 8B		155 9B		171 AB		187 BB		203 CB		219 DB		235 EB		251 FB	
140 8C		156 9C		172 AC		188 BC		204 CC		220 DC		236 EC		252 FC	
141 8D		157 9D		173 AD		189 BD		205 CD		221 DD		237 ED		253 FD	
142 8E		158 9E		174 AE		190 BE		206 CE		222 DE		238 EE		254 FE	
143 8F		159 9F		175 AF		191 BF		207 CF		223 DF		239 EF		255 FF	

Bar Codes

UPC A



UPC E



EAN 8



EAN 13



Code 39



Code 128



Interleaved 2 of 5



Postnet



FCC / IC / CE

FCC Declaration of Conformity

We declare here that this device has been tested and found to comply with the FCC Standards, Part 15 Class B

Model Name: Dot Matrix Printer PM4410

Model Number: D21001A

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Oki Data Corporatio
Takasaki Campus
8-1, Futaba-cho, Takasaki-shi, Gunma-ken, Japan

(Signed)
Isao Suda

Dated: October 5, 1998

for

Okidata, Div. of Oki America, Inc.
2000 Bishops Gate Blvd. Mt. Laurel, NJ 08054-4620

Federal Communications Commission Radio Frequency Interference Statement

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Plug the unit into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Note: It is the responsibility of the user to obtain the required shielded cable in order to ensure compliance of this equipment with FCC regulations.

Changes or modifications not expressly approved by OKIDATA may void your authority to operate this device.

Industry Canada Radio Interference Statement

This OKIDATA apparatus complies with the Class B limits for radio interference as specified in the Industry Canada Radio Interference Regulations.

European Union Council of the European Communities Statement of Electromagnetic Conformance

This product complies with the requirements of the Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic compatibility.

Warranty

Limited Warranty

Okidata, division of Oki America, Inc. (Okidata) warrants this printer to be free from defect in material and workmanship and will remedy any such defect according to the terms of this Limited Warranty. This Limited Warranty extends to the original purchaser only. This Limited Warranty does not extend to network setup, application conflicts, or consumable items, including but not limited to ribbons, fuses, etc.

Okidata will repair (or at its option, replace) at no charge, any defective component(s) of the printer for two (2) years from the date of purchase except for the printhead, which is warranted for a period of one (1) year from date of purchase. This Limited Warranty extends to the original purchaser only.

On-Site Repair

Note: On-Site repair is available in the United States and Canada only.

On-Site repair is available without charge, in the United States and Canada, provided that the warranty service is performed by an Authorized Okidata Service Center, located within a fifty (50) mile radius of the original purchaser's facility. Purchasers outside the fifty (50) mile radius may return the product, shipping prepaid, to an Okidata Authorized Service Center. A listing of Okidata Authorized Service Centers may be obtained by calling 1-800-OKIDATA (1-800-654-3282).

To make request or claim for service under this Limited Warranty, contact your Okidata Authorized Dealer, authorized third-party service provider, or Okidata.

A written receipt for the product, showing the date of purchase, dealer's name, and serial number of the Pacemark 4410 printer, must accompany any request or claim for work to be performed under this Limited Warranty.

This Limited Warranty shall not apply if the product has been damaged due to abuse, misuse, misapplication, accident, or as a result of service or modification by any other than an authorized Okidata service center.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE ON THE FACE HEREOF AND DESCRIBED ABOVE. NO WARRANTIES WHETHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXTEND BEYOND THE RESPECTIVE WARRANTY PERIOD DESCRIBED ABOVE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

OKIDATA SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSS ARISING FROM THE USE OF THIS PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

Additional information on obtaining service under this Limited Warranty is available by contacting the Okidata dealer from whom the product was purchased, by contacting Okidata directly at 1-800-OKIDATA (U.S. and Canada, English only) or at 1-609-222-5276 (Spanish only), or by contacting one of the service locations listed below.

United States Okidata Tel: 1-800-OKIDATA (1-800-654-3282) Fax: 1-609-222-5247	Canada Okidata Tel: 1-800-OKIDATA (1-800-654-3282) Fax: 905-238-4427
Brazil Oki Data do Brasil, Ltda Tel: (5511) 5589-1518 Fax: (5511) 5584-0267	Mexico Oki Data de Mexico, S.A. de C.V. Tel: 525-661-6860 Fax: 525-661-5861

This Limited Warranty applies to this printer. However, the procedure for obtaining service may vary outside the continental United States. Contact your Okidata dealer for such warranty service information. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Symbols

- # Graphic bits menu item 14
- # Serial bits menu item 16, 17

A

- Abicomp character set 128
- Access cover 42
- Accessories 42-43
 - purchasing 41
- Adapter card 42
- Alarm light 8
- ASCII character sets
 - lower 112-115
 - upper 116-119
- Auto CR menu item 15, 17
- Auto feed XT menu item 16, 17
- Auto LF menu item 15, 17
- Auto path menu item 15, 17
- Auto select menu item 15, 17

B

- Bar codes
 - commands 91-93
 - sample 130
- Baud rate 51
- Baud rate menu item 16, 17
- Bi-direction menu item 16, 17
- Block graphics character set 129
- BRASCII character set 128
- Busy line menu item 16, 17
- Busy time menu item 16, 17

C

- Cable configurations, IBM 52
- Card stock specifications 46
- CE statement 132
- Character set menu item 13, 17
- Character sets 112-130
- Characters per line 45
- Cleaning the housing 29-31
- Code 128 bar code 130
- Code 139 bar code 130
- Code page
 - character sets 122-125, 128
 - menu item 13, 17
- Command summary 56-110
 - Epson FX 56-68
 - IBM Proprinter III 69-79
 - Okidata Microline 79-90
- Config button 9
- Configurations
 - saving 11-12
 - switching 12
- Control panel buttons 9
- Covers
 - printhead access 42
 - tear bar 43
- Custom fonts commands 94-97

D

- Data word size menu item 15, 18
- Default path menu item 15, 18
- Diagnostic text 16
 - menu item 18
- Dimensions 47
- DSR signal menu item 16, 18
- DTR signal menu item 16, 18

E

EAN bar codes	130
Electrical specifications	48
Emulation mode	
command	56
menu item	13, 18
Emulations	45
Energy Star statement	2
Envelopes	
jams, troubleshooting	34
specifications	46
Environmental specifications	47
Epson	
Abicomp character set	128
BRASCII character set	128
FX commands	56-110
bar code	91-93
character control	62, 63
character set	63, 64
custom font	94-97
DLL character set	65
graphics control	65, 66, 67, 68
horizontal control	59, 60
print style/print size control	60, 61, 62
printer operation/data control	56-57
printer operation/data control	56, 57
vertical control	57, 58
international character substitutions	120
ESC SI pitch menu item	15, 18
Ethernet interface	45, 54
card	42
European Union Council statement	132

F

FCC/IC/CE statements	131-132
FF/Load button	9
Font	
menu group	13
specifications	45
Form tear-off menu item	13, 14, 18
Frequency specifications	48
Front feed	
jams	25-26
menu group	14
specifications	46
Front panel	8-21
Fuse	42
replacement	28

G

General specifications	44-45
Graphic bits menu item	14, 17
Graphics character set, block	129
Graphics menu item	14, 18
Group button	9, 10
Guide, paper	42

H

Hex dump mode	111
Host interface menu item	15, 19

I

I-Prime	
menu item	16, 19
signal, troubleshooting	32
I/F time out menu item	15, 19
IBM	
cable configurations	52
international character substitutions	120
multilingual code page sets	126-127
Proprinter III commands	69-79
bar code	91-93
character control	76, 77
character set	77, 78
custom font	96-97
DLL character set	78
graphics control	79
horizontal control	72, 73
print style / print size control	73
print style/print size control	74, 75, 76
printer operation/data control	69, 70
vertical control	70, 71
Impact mode menu item	15
Index paper specifications	46
Indicator lights	8
Industry Canada statement	132
Intercharacter sub set menu item	15
Interface card, network	42
Interface test, serial	53
Interfaces	45
Ethernet	54
parallel	49
serial	51
Interfacing	49-55
Interleaved 2 of 5 bar code	130

International character	
sub set menu item	19
substitutions	120, 121
ISO 8859-15 code page character set	128
Item button	9, 10

J

Jams	
envelope	34
paper	
exit	33
front feed	25-26
rear feed	27-28

L

Language set menu item	13, 19
LF button	9
LF speed menu item	16, 19
Line spacing	
menu group	14
menu item	13, 19
Lower ASCII character sets	112-115

M

Memory	
RAM	48
ROM	48
Menu	
button	9, 10
item commands	98-110
resetting	12
settings	
changing	11
explanations	17-22
Menu mode	
configuring the printer	11-16
control panel buttons	10
printing list of settings	12
resetting	12
settings summary	13-25
Messages, error	34-38
Micro Feed buttons	9
Microline standard international	
character substitutions	121
Multilingual 858 code page character set	128
Multilingual code page sets	126

N

Network interface card	42
------------------------------	----

O

OKI adapter card	42
OKI block graphics character set	129
Okidata Microline commands	79-90
bar code	91-93
character control	87
character sets	88, 89
DLL character sets	89, 90
graphics control	90
horizontal control	83, 84, 85
print style / print size control	85, 86, 87
printer operation/data control	79, 80, 81
vertical control	81, 82
On-line button	9
On-site repair	133
Operating	
humidity	47
temperature	47
Operator panel function	
menu item	15, 19
troubleshooting	32
Option button	9, 10

P

Page length menu item	13, 14, 19
Page width menu item	13, 14, 20
Paper guide	42
Paper jams	
clearing	25-28
exit	33
front feed	25
rear feed	27-28
Paper out override menu item	14, 20
Paper specifications	46
front feed	46
rear feed	47
Parallel interface	45, 49-50
menu group	16
Parity	51
menu item	16, 20
Park button	9
Path/TOF button	9
Physical specifications	47
Pin 18 menu item	16, 20

Pin assignments	
Ethernet	54
parallel	49-135
print server parallel output	55
serial	51
Pitch menu item	13, 20
Postnet bar code	130
Power cord	42
Power fuse replacement	28
Power light	8
Power specifications	48
Print DEL code menu item	15, 20
Print mode	
control panel buttons	9
indicator lights	8
menu item	13, 20
Print speed	44
Print suppress menu item	15, 20
Printer control group	13
Printhead access cover	42
Printhead life	46
Printing a list of menu items	12
Problem solving. <i>See</i> Troubleshooting	
Proportional spacing	13
menu item	20
Protocol menu item	16, 20
Purchasing parts and accessories	41
R	
RAM	48
Rear feed	
jams	27
menu group	13
specifications	47
Receive buffer	48
menu item	14, 20
Registration menu items	14, 21
Relative humidity	47
Reliability	46
Replacement parts, purchasing	41
Replacing	
fuse	28
ribbon cartridge	22-25
Reset button	9
Reset inhibit menu item	15, 21
Resetting the menu	12
Resolution, graphics	44

Ribbon	
cartridge	42
life	46
replacing	22-25
ROM	48

S

Saving configurations	11-12
Select menu item 1 command	98-105
Select menu item 2 command	105-111
Serial cable configurations	52
Serial interface	45, 51
menu group	16
test	53
Service information	38-43
on-site repair	133
service centers	134
Set-up menu group	14, 15, 16
Settings, menu, printing	12
Shift button	9
SI pitch menu items	15, 21
Size	13
menu item	21
Skip over perforation menu item	13, 14, 21
Specifications	44-48
electrical	48
environmental	47
font	45
general	44-45
memory	48
paper	46
physical	47
relative humidity	47
Reliability	46
Speed, print	44
Standard interface	45
Status light	8
Storage	
humidity	47
temperature	47
Store button	9, 10
Style	13
menu item	21
Summary of menu settings	13-25
Support information	38-43
Symbol sets menu group	13

T

Tear bar cover	43
Tear button	9
Temperature specifications	47
Test, serial interface	53
Time out print menu item	15, 21
Top of form button	9
Troubleshooting	31-37
envelope jams	34
error messages	34-38
general	31-34
I-Prime signal	32
operator panel function	32
paper jams, exit	33

U

UPC A bar code	130
UPC E bar code	130
Upper ASCII character sets	116-119

V

Voltage specifications	48
------------------------------	----

W

Warranty statement	133-134
Weight	47
Width control menu item	16, 21

Y

Year 2000 compliance	2
----------------------------	---

Z

Zero character menu item	13, 21
--------------------------------	--------